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Thyman Elliot

ANNUAL REPORT
OF THE
Minnesota State Horticultural Society

1896.

EMBRACING THE
TRANSACTIONS OF THE SOCIETY FROM DECEMBER 3, 1895, TO DECEMBER 1, 1896, INCLUDING THE TWELVE NUMBERS OF
"THE MINNESOTA HORTICULTURIST"
FOR 1896.

EDITED BY THE SECRETARY,
A. W. LATHAM,
OFFICE AND LIBRARY, 207 KASOTA BLOCK,
MINNEAPOLIS, MINN.

VOL. XXIV.

MINNEAPOLIS:
HARRISON & SMITH, STATE PRINTERS,
1896.

LETTER OF TRANSMITTAL TO THE GOVERNOR.

OFFICE OF THE SECRETARY OF THE
MINNESOTA STATE HORTICULTURAL SOCIETY. }

207 KASOTA BLOCK, MINNEAPOLIS, MINN., DEC. 1, 1896.

To the Hon. D. M. Clough, Governor of Minnesota:

SIR:—In compliance with the requirements of the law, I have the honor to submit herewith the report of our society from December 3, 1895, to December 1, 1896.

Respectfully yours,

A. W. LATHAM,
Secretary.

THE MINNESOTA HORTICULTURIST.

VOL. 24.

JANUARY, 1896.

NO. 1.

OFFICERS

OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY FOR 1896.

PRESIDENT.

J. M. UNDERWOOD.....Lake City

VICE PRESIDENTS.

E. H. S. DARTT, First Congressional District.....Owatonna

S. D. RICHARDSON, Second " "Winnebago City

MRS. A. A. KENNEDY, Third " "Hutchinson

R. S. MACKINTOSH, Fourth " "St. Anthony Park

COL. J. H. STEVENS, Fifth " "Minneapolis

J. O. BARRETT, Sixth " "Brown's Valley

MRS. JENNIE STAGER, Seventh " "Sauk Rapids

SECRETARY (AND LIBRARIAN, *Ex-Officio*.)

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207 Kasota Block, Minneapolis, Minn.

TREASURER.

F. G. GOULD - - - - - Excelsior

EXECUTIVE BOARD.

(The president and secretary are members *ex-officio*.)

WYMAN ELLIOT (Chairman) 2 years - - - Minneapolis

J. S. HARRIS, 2 years - - - - - La Crescent

Prof. S. B. GREEN, 1 year - - - St. Anthony Park

CLARENCE WEDGE, 1 year - - - Albert Lea

J. P. ANDREWS, 3 years - - - Faribault

L. R. MOYER, 3 years - - - Montevideo

ASSISTANT LIBRARIAN.

E. A. CUZNER, Essex and 27th Ave. S. E. - - - Minneapolis

(The assistant librarian has charge of the surplus reports of the society, which are stored at Pillsbury Hall, State University.)

SUPERINTENDENTS OF EXPERIMENT STATIONS. 1896.

PROF. S. B. GREEN	(Central Station, State Farm School),	St. Anthony Park
E. H. S. DARTT,	- - - - -	Owatonna
F. H. FIEDLER,	- - - - -	Fergus Falls
DEWAIN COOK,	- - - - -	Windom
CLARENCE WEDGE,	- - - - -	Albert Lea
CHAS. W. SAMPSON (grapes),	- - - - -	Eureka
O. M. LORD (plums and small fruits),	- - - - -	Minnesota City
C. W. H. HEIDEMAN (plums and small fruits),	- - - - -	New Ulm
H. M. LYMAN (apples),	- - - - -	Excelsior
J. S. HARRIS,	- - - - -	La Crescent
L. R. MOYER,	- - - - -	Montevideo
MRS. JENNIE STAGER,	- - - - -	Sauk Rapids
W. L. CASE,	- - - - -	Duluth

COMMITTEES FOR 1896.

FRUIT LIST.

Clarence Wedge	Albert Lea
J. P. Andrews	Faribault
Prof. S. B. Green	St. Anthony Park

SEEDLING FRUITS.

J. S. Harris	La Crescent
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APPLES.

Prof. N. E. Hansen	Brookings, S. D.
E. H. S. Dartt	Owatonna
C. L. Blair	St. Charles
Sidney Corp.	Hammond
W. L. Parker	Farmington

PEACHES.

J. T. Furber	Madelia
M. Pearce	Chowen
G. F. Flatin	Spring Grove

PLUMS AND CHERRIES.

W. S. Widmoyer	Dresbach
Clarence Wedge	Albert Lea
Martin Penning	Sleepy Eye

GRAPES.

W. W. Crandall	Sumter
J. W. Murray	Excelsior
Roy Underwood	Lake City

SMALL FRUITS.

C. B. Crandall	Red Wing
G. H. Prescott	Albert Lea
F. W. Kimball	Austin
F. F. Pratt	Crookston
Alton M. Shepherd	Minneapolis

FRUIT BLOSSOMS.

R. S. Mackintosh.....St. Anthony Park
L. R. Moyer.....Montevideo

FORESTRY.

C. L. Smith.....Minneapolis
Alfred Terry.....Slayton
S. M. Owen.....Minneapolis

DECIDUOUS TREES AND SHRUBS.

S. D. Richardson.....Winnebago City
Thos. Harrison.....Blanchard, N. D
F. H. Nutter.....701 Sykes Blk., Minneapolis

EVERGREENS.

Barnett Taylor..... Forestville
Mrs. J. W. Blackwell.....Fort Totten, N. D
A. K. Bush.....Dover

OUT-DOOR HERBACEOUS PLANTS.

M. Windmiller.....Mankato
A. S. Swanson.....St. Paul

HOUSE AND GREENHOUSE PLANTS.

Mrs. D. Morrison.....Villa Rosa, Minneapolis
Mrs. Wm. Lyons.....2924 Clinton Av., Minneapolis
E. A. Cuzner.....Essex and 27th Av. S. E., Minneapolis

NOMENCLATURE AND CATALOGUE.

J. S. Harris.....La Crescent
Prof. S. B. Green.....St. Anthony Park

VEGETABLES.

H. E. Burnley.....Hudson, Wis
H. L. F. Wiite.....Minneapolis
Wyman Elliot.....Minneapolis

IRRIGATION.

O. H. Thompson.....New London
P. M. Woodman.....Minneapolis
Prof. W. M. Hays.....St. Anthony Park

APICULTURE.

Wm. Urie.....Minneapolis
E. K. Jaques.....Crystal
A. S. Lovett, 1311 1st ave. S.....Minneapolis

ORNITHOLOGY.

Prof. Otto Lugger.....St. Anthony Park
J. S. Harris.....La Crescent

ENTOMOLOGY.

Chas. L. Hill.....Albert Lea
Dewain Cook.....Windom

COOKING AND PANTRY STORES.

Mrs. J. W. Kennedy.....Lake City
Mrs. Wm. Danforth.....Red Wing
Mrs. P. A. Thayer.....Sauk Rapids

PUBLICATION.

Wyman Elliot.....Minneapolis
Prof. S. B. Green.....St. Anthony Park
A. W. Latham.....Minneapolis

Biography.

WYMAN ELLIOT, MINNEAPOLIS.

(See *Frontispiece*.)

Mr. Wyman Elliot was born in the town of Corinna, Maine, May 19, 1834. He attended the common schools and completed his education by an academic course. While yet in his teens, he became useful as an assistant to his father in conducting his business, consisting of merchant, saw and grist mill and farmer. He developed at an early age a taste for horticultural pursuits, assisting his mother in the cultivation of fruits and flowers, to which she was ardently devoted. At twenty years of age he emigrated with his father to Minneapolis, then a hamlet of only seventeen houses and buildings. Here they purchased the eighty acre tract of John L. Tenney for \$1,500, which was used many years for a farm and market garden. (Mr. Elliot has the distinction of being the first market gardener in Minneapolis.)

Going to Monticello, Wright County, Minn., in the winter of 1855, he took up a claim, living in a log cabin located on the west bank of the Mississippi river near the foot of Big Bear island. This island at that time was a favorite camping ground of the Chippewa Indians. Mr. Elliot was among the first settlers and actual cultivators of land west of the Mississippi river. Upon this claim, he started a farm, raising a bountiful crop of wheat, corn, potatoes and garden vegetables. The year following, he left his claim and returned to Minneapolis, where he took charge of the home place and continued farming and market gardening for twenty-five years. From time to time, fruit, shade and ornamental trees were planted, convenient buildings erected, and the farm soon became known as the "Minneapolis Garden and Nursery." In 1862, an extensive market garden had been established. In 1864, he erected a greenhouse for the production of plants and flowers. In 1866, a nursery of trees was also planted, which not only made the Elliot farm attractive by its rows of fine shade trees, but this nursery was the source from which most of the trees were taken which have made the streets of Minneapolis so shady and beautiful. He also added to the garden and nursery the seed business, and maintained for several years a store in the city market for the sale of trees, shrubbery, plants, vegetables and flower and field seeds.

Mr. Elliot had a natural love and taste for horticulture, and, whether its indulgence brought profit or loss, he has amid his other important business enterprises always found time to engage in his favorite pursuit. Not only has he practiced the art for his own pleasure and profit, but he has labored with energy and zeal

to promote it in the community. As early as 1864, he participated in the formation of the Hennepin County Horticultural Society, and, in 1866, helped to organize the Minnesota State Horticultural Society, being one of its charter members. He has rarely missed attending the meetings of the state horticultural and agricultural societies, always participating in the discussions and contributing liberally to the literature of these societies.

He has always been an exhibitor at local and state fairs, where the tables seldom failed to show rare flowers and luscious fruits of his production. As the city developed, the farm was platted into what is now known as J. S. and Wyman Elliot's addition to Minneapolis, which is bounded by Eighth street, Eleventh avenue south, Franklin and Chicago avenues and is one of the best residence sections in the city. In 1884, he retired from the seed and nursery business and built himself a fine home on the corner of Ninth avenue and Fourteenth street south overlooking the Elliot Park, which was a donation to the city from Dr. J. S. Elliot, his father. (A cut of Mr. Elliot's residence is elsewhere printed in this issue.) The care of his now valuable property compelled him to open a real estate office, where he may now be found under the firm name of Elliot & Metcalf.

In politics, Mr. Elliot has always been a staunch Republican. He is now filling the position of alderman from the fifth ward of Minneapolis, being elected by the largest majority any alderman ever received in that ward. He holds important positions in the council, and is ex-officio member of the Park Board.

At present Mr. Elliot is first vice-president of the State Agricultural Society and chairman of the executive board of the State Horticultural Society. In the latter society he has held some office of trust nearly every year since its organization, being the first two years a member of the executive board, the treasurer for six consecutive years, then on the board again till he was elected president in 1886. This office he occupied with high honor for six years, until he was compelled to remove temporarily to California. Returning unexpectedly, he was elected chairman of the executive board, an office he continues to occupy. To his efforts in large degree the present success of the society is due, and his staunch loyalty to its service is a tower of strength that never fails. He was made an honorary life member of this society in 1882.

Mr. Elliot is a member of the Park Ave. Congregational Church. He has always contributed most liberally of his means and energy towards its upbuilding and success. In the hours of its adversity as well as of its prosperity he was ever found at his post, and especially a true friend in the hour of need, as it is his nature to be to all.

The passing years have dealt kindly with Mr. Elliot. He is broad shouldered, stout and stalwart. Though nearly sixty-one years of age, his hair is only slightly sprinkled with silver and his movements active. A life of energetic work and a mingling of rural art with the labor of uplifting others by the institutions of religion and education have done much to keep him young in body and heart and made his life a joy and blessing to his fellowmen. In the course of nature, he has a quarter of a century of usefulness yet before him, and it is the earnest hope of his many friends that it may be meted out to him in full.

THE TWENTY-NINTH ANNUAL MEETING OF THE MINNESOTA STATE HORTICULTURAL SOCIETY.

A. W. LATHAM, SECY.

Through the hospitality of the commissioners of Hennepin county, this meeting was convened in their rooms in the new court-house, which was just occupied. The accommodations consisted of three rooms, that in which the sessions were held, which would seat comfortably perhaps 200 people, the room for the fruit exhibit and an intermediate room found convenient as a cloak room and for the overflow of the exhibit. The society is under great obligations for the use of such elegant quarters. If we are ever so fortunate as to own a hall, such a one as our sessions were held in this year would be all or more than we could ask for.

Perhaps the most noticable feature of the meeting was the exhibit, consisting mainly of apples, although probably fifty plates of grapes were shown and at least two varieties of peaches and several plates of pears. The apple exhibit was far beyond any of our anticipations. About 116 named varieties were on the table, most being shown by several different exhibitors, and a large number of seedling varieties of which no accurate record was kept. A large portion of the fruit had been preserved in cold storage, but a great deal came directly from the homes of the exhibitors and was apparently in as good condition. Now that the feasibility of a winter show has been demonstrated, there is no reason why this should not become a permanent feature of our annual meeting. A full list of the awards appears in this issue.

The sessions were well attended, the room being comfortably filled most of the time, and sometimes would have been overcrowded had it not been for the rival attraction of the fruit exhibit.

With few omissions the program as arranged was carried out. All of the invited guests from abroad were in attendance, with the exception of Prof. E. S. Goff, of Madison, Wis., whose necessary absence was much regretted. The Wisconsin society was represented in the persons of Messrs. R. J. Coe, George J. Kellogg, and the secretary of their society, Mr. A. J. Philips. Their presence added materially to the interest of the occasion. South Dakota sent us the professor of horticulture from their state experiment station, Prof. N. E. Hansen. We found his knowledge of horticultural subjects of great advantage, and hope his nearness to us may give us the opportunity of having his presence at all of our gatherings. From the Iowa state society came Mr. A. F. Collman, and from the Northeast Iowa society, Mr. Charles F. Gardner. These gentlemen were both old acquaintances of many of our people, and we were very glad to meet them again. All of the delegates from abroad were made honorary members for one year. An honorary life membership was conferred upon one of the oldest members of our society, Mr. Amasa Stewart, formerly of Hennepin county but now a resident of Lamarque, Texas, a well deserved recognition of many years of useful labor in horticultural interests in our midst.

A detailed review of the meeting is unnecessary at this time, as all of the papers and discussions connected therewith will appear

in the course of the year in the HORTICULTURIST. At the election there was no contest whatever, and all of the retiring officers were re-elected. The wisdom or the change in the constitution a year ago, throwing the management of the society upon the executive board, was demonstrated by the occupation of almost the entire time by papers and discussions upon horticulture. The consideration of ways and means by the society necessarily detracts from the real interests of the meeting and are seen to be more wisely left to a trusted few.

Subjects of especial interest at the meeting were the joint report of Prof. Green and Mr. Wedge on the orchards of the state and the consideration of the subject of top-working, the discussion of which was lead by Secretary Philips.

The sentiments of those in attendance were well stated in the concluding words of a description of the meeting which appeared in "The Wisconsin Agriculturist." "Taking it all in all, the Minnesota people had a very pleasant meeting; no let up,—at the hall, on the street, at the hotel table, after going to bed or on the train, and it lasted until only one horticulturist was left."

NOTICE OF FORESTRY MEETING.

The 20th annual meeting of the Minnesota State Forestry Association will be held in the parlors of the Commercial Club, Minneapolis, Tuesday, Jan., 14 and 15, 1896. The first day, commencing at 2 o'clock p. m., will be devoted to preliminary business of the association.

PROGRAM.

WEDNESDAY, 15th, 10 O'CLOCK A. M.

1. Condition of our Forests, by S. M. Owen, President of the Association.
2. Work done for the Prevention and Suppression of Forest Fires, by C. C. Andrews, Chief Forest Fire Warden.
3. Stump Lands, by H. B. Ayers.
4. Value of our Forests from a Commercial Standpoint, by O. F. Brand.
5. Old and new Forestry, by John H. Stevens.
6. Esthetics of Forestry, by Wm. R. Dobbyn.

2 O'CLOCK P. M.

7. Forest Protection to Fruit Plants, by Wm. Somerville.
8. What Trees shall we Plant? by L. R. Moyer.
9. Work done for Forestry by the Experiment Station, by Prof. S. B. Green.
10. Relation of Forests to our Reservoirs, by W. A. Jones, Lt. Col., Corps of Engineers, U. S. Army.
11. Influence of Forests upon the Weather, by Edw. A. Beals, U.S. Weather Bureau.

12. Forestry as a Factor of Agriculture, by Prof. W. M. Hays.
13. Secretary's report and election of officers for the ensuing year.

The members of the association are earnestly solicited to attend this important meeting, and every other friend of forestry is cordially invited to engage in the discussions upon the various subjects of consideration. A greater work than ever is before us. Let us prepare for it.

J. O. BARRETT,
Secretary.

Official Reports.

PRESIDENT'S ANNUAL ADDRESS, DEC. 3, 1895.

J. M. UNDERWOOD, LAKE CITY.

Members of the Minnesota State Horticultural Society:

Days, weeks and months have followed each other in such rapid succession that but for the change in surroundings from the humble, quiet block in which we met a year ago to this magnificent monument of grandeur, one might easily imagine this an adjourned session of last winter's meeting. But thus it is, time has quickly flown, and *Action* is the ruling spirit of the hour—it pervades every animate object, and its subtle power leaves its trace even upon all inanimate nature. Nothing can stand still; all people, all things must go forward to perfection, or, ceasing to act, they must decay and pass away, giving place to the growth and development that comes from action.

In physical development, the healthy child speedily rounds out in form and becomes a perfect medium through which the mind springs into action, and the two working harmoniously together go on unceasingly forward to their highest attainment, although they are subject to the influences that surround them both for good or evil. A careless diet for the child brings on indigestion, colic and numerous other maladies that work consternation for the parent. The dangerous period of physical development once passed, the cares and anxiety of spiritual and mental development begin, and now the most important and delicate duties to perform are thrust upon them. Microbes of vice and pernicious habit surround on every side, their best friends burden them with influences that tend to drag them down and dwarf and hinder them, until, finally, the care and anxiety of the parent is taken up by the person himself, and unceasing action must prevail on his part if they would triumph over the enemies to his highest development.

If we turn to nature, what wonderful illustrations of unceasing action do we there find. As we look at the ceaseless flow of water in the mighty Mississippi, is it not marvelous what springs of action can keep its bed supplied, or if we pay a visit to some brooklet with which we were familiar in our childhood, is it not a surprise to find it still running? One would suppose they had both had time to carry off the water that supplied them and leave their channels dry. And so with all the streams of the world—have they not had time to perform their functions and stop? They would have but for the unseen action of evaporation that goes constantly on until the moisture laden atmosphere driven by varying currents of heat and cold rushes across the land and furnishes a fresh supply.

Turn again to nature and note the action performed by the sluggish earthworm. It seems incredible, but it is stated by naturalists

who have studied their habits that they work so constantly in the ground they prevent it from solidifying, by spading, so as to speak, and turning it over several times in a season; and yet they do it so quietly and unseen that we do not give them credit for doing anything. Thus it is with mankind, those that perform most make the least fuss about it. Action, then, is the mainspring of all spiritual, mental or physical growth. It is, therefore, the basis on which we, as a society, must work and develop the object for which we are banded together.

The horticulture of Minnesota cannot stand still; it must either go back to wormy crabs or forward to perfect forms of the highest type of apples. We may sometimes oscillate back and forth with varying degrees of success and failure, but we cannot stand still; and if, like going back to visit the streams of childhood, some of our friends that have laid down their work on earth could come to us again, they would find that we have made marked progress, that action had been with us, as with them, the rule of life. The harder the fight, the greater the obstacles to overcome, the greater must be our activity. There is nothing so selfish as to stand serenely by while others work, no matter in what position in life we are placed and I reflect with pleasure on the splendid work of those who have done so much to advance the cause of horticulture in our state. The voices of our veteran friends ring with cheers of "Onward to action!" and as I contemplate the lesson and example of Stevens, and Grimes, and Harris, and Elliot, and Fuller, and Dartt, and Lord, and Day, and Frisselle, and the tall sycamore of horticulture, Wm. Somerville, and a score of others, my heart beats with pride that for the past thirty years I have been permitted to be an active co-worker with them, sitting at their feet for council and encouragement. I stand now in life where they were when I first knew them, and although their heads have grown gray and their sight, perhaps, more dim, still their hearts are the same large, warm fountains of encouragement and good cheer that find expression in the clear voice of familiar command to press forward in our work to the ultimate and final triumph of success for horticulture in Minnesota. We who now share the fruits of their labor must step up and take our places in performing the heavier work that has become too great a burden for their years.

It would be a pleasure to me to rehearse here the features of our work for the past year, but there would be so much to say that I should worry you, and as they will all be brought out in the reports of our committees and their discussions, I will forbear to anticipate them. I must, however, speak of a few things I deem of great importance to our secretary. First, let me say that it has been a most fortunate change for good in having our proceedings published in monthly form, and I think those of us who have helped to bring this about can indulge in a feeling of justifiable pride in its success.

It is a commendable thing to map out a course in life and work through all obstacles to achieve a purpose, but it is a much smarter thing to recognize an opportunity and grasp it, and this is what was done when the Minnesota State Horticultural Society was es-

tablished. And let me say right here, we cannot give too much credit to our secretary, Mr. Latham, for his able assistance in bringing this about. He has proved himself, as we knew he would, the right man in the right place, and the commendation he has received from all sources, I consider well deserved.

I wish to congratulate our society on the splendid exhibit of fruit and flowers that was made at the State Fair. It was a fine compliment to the success of horticulture in Minnesota. But oh! the groans that came from exhibitors over the meagre premiums that were paid were heart rending. And when a pig that can be raised in six months is considered of greater importance than the fruit of a tree that has required years of care, it is little wonder that exhibitors are disgusted.

A year ago the meagre representation of our society in the State Agricultural Society was discussed and resolutions adopted looking to its correction. Let us still further urge our claims. With proper encouragement on the part of that society, we could easily put up an exhibit that would fill the whole building. that is now shared with the agricultural exhibit.

Our Farmers' Institute has still proved a great medium for the dissemination of knowledge in progressive farming. It is a field we ought to keep fully occupied. It is ours if we are a mind to use it. If we allow the horse to browse our trees, the cow to despoil our evergreens; if we allow in our institute, Gregg, Louis and Tillson to pass the milk, cheese and butter, the roast pork, chicken and eggs, and fail to "Wedge" in the apples, grapes and strawberry shortcake, we must not complain of our dinner.

The season of '95 has been one of great value to the horticulturists of Minnesota. There have been many and valuable experiences, and I do not doubt but that when our sessions close, we shall still pronounce the last the best of all our meetings.

REPORT OF THE EXECUTIVE BOARD FOR 1895.

WYMAN ELLIOT, CHAIRMAN.

The past year marks another milestone in the advance of this society toward greater usefulness to the population of this great state.

Progress has been made in many directions for improving the working conditions of this most progressive organization. One year ago recommendation was made that application be made to the state legislature for an additional appropriation for the support and maintenance of this society. Through the influence of friends in and out of the legislature, we have succeeded in making some changes in the publication of our reports that are very advantageous to the interests of horticulture through the whole state, and with the additional five hundred dollars received, we shall be able to broaden and widen the scope of our work very materially.

As the state develops and the people become more enlightened, we find the demands for horticultural education greater among the masses.

Increased membership calls for increased facilities for teaching

and administering to our several wants. Every member should appreciate the efforts that have been put forth by the officers in giving so much of their time and attention in the administration of its affairs during the past year. From personal knowledge, I am sure conscientious and sound business methods have been used. They have endeavored to give hearty co-operation to the State Agricultural Society in holding the very successful fair the past season.

Our aim and desire has been to secure the best recognition of horticultural interests and adequate premiums to create a healthful competition amongst our fruit and flower exhibitors. In doing this our efforts have met with great opposition from some members of the State Fair Board. This comes largely from their preconceived ideas of diverse interests and their neglected horticultural education—more an error of the head than of the heart. The tendency in the past has always been to reduce the premiums on horticultural products to a minimum, below what their true merits demand. If we expect to get a proper recognition and adequate means for presenting a respectable premium list to our horticultural people for a salutary competition, this society should insist upon having a representative member each year upon the State Fair board.

We wish to recognize the splendid efforts of some friends who have done valiant work for the promotion of horticultural education among the farmers of our state. We should in some fitting manner commend the very efficient services rendered by Mr. Clarence Wedge in spreading the gospel of horticulture at our Farmers' Institutes. Superintendent Gregg reports that this line of education as presented to the farmers by him will in the near future be like seed cast upon the ground, springing up and bearing four-fold.

A permanent home for this society is each year becoming more and more a necessity, and some measure should be taken that will in the near future accomplish this purpose.

Our library will soon be crowding the cramped quarters in which it is located, and a change of location will be a necessity. We wish to make one suggestion: Every member of this society ought to feel there is an imperative duty resting upon him, that no one else can perform. All should exert their influence by all possible means among their friends and acquaintances to increase the circulation of "The Minnesota Horticulturist" and secure more memberships to this society. If we should recount the many methods that have been advocated in the past twenty-nine years of our history, whereby this object might be accomplished, you would become weary. Every successive year some new method has been tried, but the only successful one that has given us much of an increase has been the persistent effort of all the members pulling together in that one direction. In place of 400 or 500 we should have 1,000 members in this large state with a population of 1,500,000. This would be only one member for every 1,500 of population. With such a following, all working for the upbuilding of a most worthy industry, it would help improve and clothe our hillsides and valleys with orchards, fruit gardens and vineyards, supplying an abundance of healthful fruits and beautiful flowers. Will not every member pres

ent pledge himself to secure ten memberships; and if these ten new members could in turn get five more subscribers to our monthly report, what an impetus it would give our society!

Please fix this last suggestion in your minds, remembering how easily you can benefit your own society and mankind in general.

SECRETARY'S ANNUAL REPORT, 1895.

A. W. LATHAM, MINNEAPOLIS.

Mr. President and fellow members of the Minnesota State Horticultural Society:

The annual report which I bring to you at this time is the record of a year of important events in the history of our society. During the previous year an experiment had been undertaken in connection with the publication of our reports as to the success of which there was some doubt, but the change proved to have been well received by you and was adapted apparently to the fuller accomplishment of our laudable purposes. The natural sequence of this successful experiment was the formation of a plan to assure its permanence.

□LEGISLATION.—To bring this about, it was necessary that an appeal should be made to the state legislature, which, fortunately for our purpose, was in session last winter. A bill was accordingly prepared by your executive board, which in due time became a law. The substance of this bill you already know, as it was published in one of the earlier magazines for the year. When introduced, it provided not only for the publication of our magazine by the state but also for an annual appropriation of \$1,500, an increased income being deemed necessary on account of the increased expense of maintaining an office and library, which were absolutely needed in the publication of our magazine and in the cultivation of the wider field of usefulness that the society had determined to occupy. In this form the bill passed the house with only two negative votes, and at least one of these was because the voter did not understand the purpose of the law. This almost unanimous approval of the house was very gratifying to us. When the bill reached the senate finance committee, they insisted on dividing it and putting the additional appropriation into the general appropriation bill, where it now stands, although it provides for an annual appropriation of the amount asked for without further legislation.

The printing bill, now shorn of its monetary feature, passed the senate without an opposing vote. In my personal contact with the various members of the two houses—my frequent presence there being necessary during the progress of affairs—I heard only the kindest words of the work of our society and a universal desire to assist it in any way that we might ask.

In securing the passage of this legislation the members of the society were requested to interview their senators and representatives and invite their assistance. A very large number of our fraternity heartily responded to this request and so notified me. In this connection special mention is due to some of the members of the legis-

lative committee, who willingly dropped their personal work at any moment when help was required. As Mr. Wyman Elliot is chairman of the legislative committee, and I am sure he will fail to speak of this in his report, I will take occasion to say that, although an exceedingly busy man, at every call made upon his services he responded promptly, and went to St. Paul a number of times in connection with this business. Other members who responded to similar calls were our honored president, the genial professor of horticulture at the experiment station and Prof. Hays, our very good friend; nor must I forget Prof. W. W. Pendergast, whose office at the capitol made it convenient for us to call upon him, and who gave us the benefit of his influence on every needed occasion.

We are to be congratulated in that all of our plans for the permanency of the work of the society on the higher and broader plane upon which we have stepped have been fully consummated. These plans include, first, the change in the constitution, which was found necessary to give the character of permanence to our work and prevent any hasty or undesired change in the management, involving a possible overthrow of matured plans; second, the legislation needed to authorize the publication of our report in the form of a monthly magazine; third, an increased appropriation; and, fourth, the development of our library. The fifth object, to which we look forward with assurance and that faith which takes hold upon the future, is a permanent abiding place for the society. Just how or when this may come about is still indefinite, but we are assured that an association with such elements of life in it as this contains will, in the nature of things, in time become the owner of a home.

Under the new law the magazine may be increased in size somewhat, not exceeding fifty pages per month, and it is the intention in the future to supplement the papers and proceedings of the association by selections from the doings of other societies and from horticultural publications, and to embellish it to a larger degree than heretofore by attractive engravings. There is one feature of the magazine which its editor would gladly see developed, and that is the page set aside under the title of "Your Corner," to be used by our members. So far there is small indication of a desire on your part to use this space. It might be the means of adding much to the interest of the magazine, which, you must remember, is yours, and perhaps in the future you may think proper to give this feature more attention.

LIBRARY.—The library is rapidly increasing, and visitors will see at a glance that the space allotted in the office for this purpose is already very fully occupied. The number of volumes received this year is about eighty. This does not include the exchanges, i. e., the horticultural papers and magazines, of which we receive regularly about thirty, nor the reports of the experiment stations, of which there are fifty-four in the United States, nearly all of which are sending their bulletins to our office. Much of this loose material, bulletins and periodicals, will be put into shape later and bound. This involves a small expense, but so far this has been met without cost to the society.

It would be very desirable if another class of books besides these regular reports, which come to us gratuitously, could be added to our library. I refer to various horticultural publications which are issued as text books, or otherwise, and which cannot well be had in any other way than by purchase,—although a few of these books have at various times been presented to the society. If the board should in the future see fit to appropriate a small sum for this purpose, it would be money well invested. We expect in time to fall heir to the libraries of some of our members and other friends of the society, but, as additions of this kind involve the loss of companionship of those who are endeared to us, we willingly postpone as long as can be such acquisitions.

The assistant librarian reports no material change in regard to the stock of books stored at Pillsbury Hall, he having sent out during the past year only three files, besides a few small packages, most of the reports being sent directly from the secretary's office. The only addition to this reserved store are the reports of 1894.

MEMBERSHIP—The annual membership for the year 1895 now numbers 459, which is a few less than the year before. (Since writing this report the number has been increased to 480, and is steadily growing.) There are a number of natural causes for this, and it need not be a source of discouragement to us. I will mention of these: First, the premiums offered in 1894 were altogether too liberal and attracted some for them alone, who, being unable to secure premiums the second year, dropped out. Second, the magazine not being published, pending the action of the legislature, until late last spring, no special effort could be made early in the year to increase the list, and that valuable time was in some degree lost. Of course, also, the condition of the times and general scarcity of money affected us very materially. With the active assistance of all the interested members of the society, there is no reason why this publication should not find its way into a very largely increased number of Minnesota homes.

The following persons have been added to the life roll the past year: Honorary—Edson Gaylord, Nora Springs, Ia. Paid—Alfred Terry, Slayton; Sheldon Evans, La Crescent; Mrs. Ida Thompson, Duluth; Chas. F. Gardner, Osage, Ia.

STATE FAIR.—It was my pleasure to serve the society again this year at the state fair, as heretofore, and I am happy to be able to say that, with the very hearty co-operation which was given by our members, the exhibit in our department was one of the best, and probably the largest, that has ever been at the fair grounds. This result was attained in spite of the very low premiums which were offered, and only because our society was desirous of sustaining its reputation. We have assurance from some of the officers of the Agricultural Society that this discrimination against us will be remedied before another fair, but it seems wise that during this session we should take some notice of this situation and express our views thereon with due emphasis.

FINANCIAL REPORT.

RECEIPTS.

Life membership fees.....	\$34.00
Advertisements in magazine.....	94.75
Subscribers from Wisconsin society.....	3.50
Paper sold.....	.50
Annual fees for 1895.....	410.00
Annual fees for 1896.....	41.00

Total..... \$583.75

DISBURSEMENTS.

Postage.....	\$99.00
Express.....	52.64
Directing and mailing magazine.....	15.40
Commission on memberships.....	11.00
Reporting meetings.....	39.35
Office rent.....	132.00
Expenses of delegate to Wisconsin.....	11.50
Printing.....	93.65
Assistance in the office.....	37.15
Sundries.....	32.18

Total..... \$573.87

SECRETARY'S OFFICE.—You may be interested to know something of the internal workings of the secretary's office. When I assumed the office in January, 1891, the legacy from my predecessor consisted of a record book for the executive committee—which is still in use—and the membership stubs for the previous year. Evidently up to that time it had not been the plan of the management to introduce elements of permanence into this department of the society, otherwise than through the preservation of the printed reports. Without taking up your time to record the successive steps which have brought the office to its present stage of comparative development, I will refer briefly to the conditions now prevailing. The correspondence of the office is filed away for convenient reference, and this has been done during the five years of my service. There are membership rolls in a substantial form showing by years, and also alphabetically, the annual membership since the organization of the society. There is also a similar roll for life and honorary members. There is an official record of the officers of the society since its beginning. In connection with the library there are two record books, the first of which is called the accession record. In this is recorded the title of every book as received and some other facts relating thereto. Each book is given a number in this roll. There has been prepared another record book for use in the library which has not yet come into play, but it will be needed later. Besides these are several other minor record books, containing lists of officers of other horticultural societies, fruit growers of the state, subscribers to our magazine, etc. The accounts of the society are kept in a ledger which shows in full the receipts and disbursements of the office and all personal debits and credits, of which there more or less connected with the advertising, life memberships, etc.

As you saw by my report as given above, the receipts of the office are principally from membership fees and advertising. On the membership record books all the members are numbered consecutively, and the cash account in the ledger shows receipts to correspond with the number of members enrolled. The disbursements of the secretary's office include office rent and printing, and in a general way the minor expenses connected with the office and the management of the society. Receipts are taken for all amounts expended of \$1.00 and upwards, and these receipts are filed for examination by the executive board, and afterwards for preservation in the same manner as the correspondence of the office. It is now the practice of the board to examine and audit the secretary's accounts semi-annually.

As to further details of the working of the office, with which I will not weary you, I shall be glad to show or explain to any who may feel a further interest in the matter.

CONCLUSION.—This brief report closes my work as secretary for the fifth year of my service. That this service has been pleasant to me I am sure you know, and not the least pleasant feature connected with it, in fact, the pleasantest, is the entire harmony between myself and the working officers of the society and, indeed the entire management of the association. Not having had experience with similar associations I am unable to make comparisons, but in looking over these past five years, it is certainly a cause of great satisfaction and a bright augury for the future, that the machinery of the organization should run with such uniform smoothness. Under these favorable conditions we may well look forward with happy assurance to a satisfactory accomplishment of the beneficent work entrusted to our charge. I have the honor to remain

Yours fraternally, A. W. LATHAM, Sec'y:

ANNUAL REPORT OF THE TREASURER. . .

F. G. GOULD, EXCELSIOR.

From July 1 to Dec. 5, 1895.

RECEIPTS.		DISBURSEMENTS.	
1895.		1895.	
July 1.	State treasurer..... \$500.00	July 1.	Order No. 17, Sec'y salary for 1st quarter of 1895... \$150.00
	A. W. Latham, Sec'y, following:		Order No. 18, A. W. Latham expenses of secretary's office..... 383.17
	O. F. Gardner, first ½ life fee..... 5.00		Order No. 20, A. W. Latham secretary's salary for 2d quarter, 1895..... 150.00
	E. E. Harris, last ½ life fee 5.00	Sept. 24.	L. R. Moyer..... 12.03
	A. Terry, full life fee..... 10.00		S. B. Green..... 23.76
	O. W. Sampson, for writing paper..... .50		J. P. Andrews..... 5.00
	Richard & Patten, Ad. in Horticulturist, 1895..... 9.00		J. S. Harris..... 10.60
	E. P. Stacy, Ad. in Horticulturist, 1895..... 11.00		Ditus Day..... 16.50
	R. J. Mendenhall, Ad. in Horticulturist, 1894..... 9.00		Clarence Wedge..... 22.44
	A. H. Brackett, Ad. in Horticulturist, 1895..... 1.00		A. W. Latham..... 150.00
	Membership fees for 1895, from Nos. 50 to 359 (inclusive)..... 310.00		Typewriter, Smith Premier..... 25.00
	Bal. bro't forward from Ditus Day's account, but money not handed in.... \$ 29		C. A. Sargent..... 2.50
	Cash in hand to me paid by Ditus Day..... 5.41		B. Taylor..... 4.00
Sept. 4.	From state treasurer..... 250.00		J. R. Cummings..... .50
			Wm. Danforth..... 3.75
			F. G. Gould..... 1.00
			F. G. Gould..... 6.29
			To Balance in Treasury.. 156.66
	1,122.20		\$1,122.20

FRUIT LIST.—1896.

Adopted by the Minnesota State Horticultural Society, December 5, 1895.

APPLES.

Of the first degree of hardiness for planting in Minnesota; DUCHESS (a) (see foot note), HIBERNAL (b), CHARLAMOF (c).

Of the second degree of hardiness: Wealthy (d), Longfield (d) (r), Tetofsky, Malinda (x) (d).

Promising varieties for trial: Patten's Greening, Okabena, Peerless, Repka Malenka, Anisim, Yellow Sweet (x), Kaump (r), Gilbert, Brett, Christmas (x), Blushed Colville, Cross 413, White Pigeon (r).

CRAB AND HYBRIDS.

Best for general cultivation: Virginia, Martha, Whitney, Early Strawberry, Minnesota (x), Sweet Russett, Gideon's No. 6, Briar Sweet, Tonka, Powers.

Crabs and hybrids for trial: Dartt, Greenwood, Pride of Minneapolis, Crampton's No. 3.

PLUMS.

Best for general cultivation: Desota, Forest Garden, Weaver, Cheney, Wolf, Rollingsstone.

Most promising varieties for trial: Rockford, Wyant, Ocheeda, New Ulm, Stoddard, Surprise, Mankato.

GRAPES.

Concord, Delaware, Moore's Early, Worden, Agawam, Brighton, Janesville (z).

RASPBERRIES.

Red varieties: Marlboro, Turner, Cuthbert, Brandywine.

Black and purple varieties: Ohio, Palmer, Nemaha, Gregg, Schaffer, Older, Souhegan.

BLACKBERRIES.

Ancient Briton, Snyder, Badger.

CURRANTS.

Red Dutch, White Grape, Victoria, Stewart, Long Bunch Holland, North Star.

GOOSEBERRIES.

Houghton, Downing. Varieties for trial: Red Jacket, Triumph.

STRAWBERRIES.

Pistillate: Crescent, Warfield, Haverland. Staminate: Bederwood, Capt. Jack, Wilson, Enhance, Lovett.

NATIVE FRUITS.

Valuable for trial: Dwarf Juneberry, Sand Cherry.

(a) Borovinka and Glass Green resemble the Duchess and are equally safe kinds.

(b) Lieby (Recumbent), Juicy Burr and Romna closely resemble the Hibernial and are equally safe kinds.

(c) Peterson's Charlamof.—There are two distinct kinds under this name. The one here referred to is of spreading growth and bears roundish, conical shaped fruit.

(d) Does best top-worked.

(x) Tardy bearer. (r) Early bearer. (z) For severe situations.

DISCUSSION ON THE FRUIT LIST.

Mr. Clarence Wedge: We submit to you practically the same list as a year ago, with some few items changed. We have seen fit on account of the extremely good behavior of the Charlamof, as we have found it throughout the state, also in northern Iowa, to put it on the general list for planting. (Reads) "Of the first degree of hardiness for planting in Minnesota: Duchess, Hiberna, Charlamof."

We make something of an innovation this year by adding some foot-notes to the list. For instance, we have added a foot note to the Duchess—and I suppose the printers will set it up with a letter referring to a letter in the margin at the foot. To the first list we have added the Charlamof, and the foot-note distinguishes it from Peterson's Charlamof and describes it as of an oval shape.

Mr. J. S. Harris: It does not correspond with the description; he said it was oval shaped, and the form is roundish-conical instead.

Mr. Wedge: Our aim was to make the description popular, instead of exact.

Mr. Harris: The Charlamof is distinctly conical; it is not egg shaped. An egg is oval shaped.

Mr. L. R. Moyer: I suggest that the Duchess be called the Oldenburg. That is the name for it, and I think in making out this fruit list we ought to use the right names.

Mr. Harris: The American Pomological Society calls it the Oldenburg, and it is so known in Canada, and we cannot go back of the authority of the American Pomological Society.

Mr. C. L. Smith: I can see no reason why our society should drop the name, Duchess, and substitute the name, Oldenburg, because the principal use of the report we send out is the guidance of the people of Minnesota. When they see the apples in the market they speak of them as the Duchess, and the apple is known all over as the Duchess, and if we want to put it in parenthesis as the Oldenburg I do not think there would be any objection, but I think we want to put it in our fruit list as the Duchess.

Mr. J. O. Barrett: Universally, all over the country that apple is known as the Duchess for short, and we ought not to confuse the people. When they send to the nurseryman for that variety, they mention it by that name, and if we give it a new name it will confuse the yeomanry of the country.

Mr. G. J. Kellogg, Janesville, Wis.: I was just sympathizing with the yeomanry of the country and the ignorant people we were talking about in this convention. I would suggest you put it in as Oldenburg proper and add the name of Duchess in parenthesis.

Mr. A. J. Philips, West Salem, Wis.: I fully agree with what Mr. Barrett and Mr. Smith have said. I have had a dozen letters from people who have asked me what that new variety was that was recommended in the paper, called the Oldenburg. I believe that we should call it the Duchess as the name by which it has always been known.

Mr. A. F. Collman, Corning, Ia.: We had a discussion similar to this in our meeting last winter. While some of us wanted to change the name to Oldenburg, the majority thought we ought to stick to the old name by which it is commonly known.

Mr. Harris: I think the very thing we ought to do is to put the name Oldenburg in parenthesis.

Mr. Wm. Somerville: I do not think it would be right to change the name of Duchess, because it might lead to a similar mistake that is made with other varieties of apples. Some of our nurserymen are taking advantage of the Borovinka and selling it as a winter apple. This I know to be so, and they would take the same advantage should we go to work and change the name of the Duchess to Oldenburg. They would do exactly the same thing.

Prof. S. B. Green: I move to put the Oldenburg in parenthesis.

Mr. Kellogg: Put it Duchess of Oldenburg, that is the way we want it.

Mr. Wedge: This is for the guidance of the plain people of the country, not for the nurseryman.

Prof. Green: I think if we had the name, Oldenburg, right after Duchess, they would know.

Prof. N. E. Hansen, Brookings, S. D.: It seems to me a better way would be to keep the name of Duchess, and then explain in a foot-note that it is known as the Oldenburg, and is so adopted by the American Pomological Society.

On motion of Mr. Wyman Elliot the list of apples of the first degree of hardiness was adopted, as recommended by the committee.

Mr. Wedge: Of the second degree of hardiness we have the Wealthy, Longfield, Tetofsky and Malinda. We have now promoted the Charlamof and have added the Malinda to the

second list, but with two foot-notes. The first foot-note is "Tardy bearer." The second foot-note, "Does best top-worked."

Mr. F. G. Gould: I would like to ask a question. I want to ask Mr. Wedge if in transferring the Charlamof to the first list whether he considered the question of its being a blighter or not. I do not know that it is a very bad blighter, but I think it would be an injustice to the public if it was a blighter to put it on the first list. I asked the question for that reason.

Mr. Wedge: We have endeavored to consider every phase that entered into its hardiness in the broadest sense of the term. We found the tree a little more subject to blight than the Duchess, but Mr. Peterson's trees have been set over twenty years and they still look beautiful, and the people of northern Iowa endorse it. I think it is a very safe variety as regards blight.

Mr. Somerville: I do not see that the Malinda is a tardy bearer. I have got some Malinda apples in the other room that are certainly nice ones, from a three year old tree, and these came into bearing as soon as any tree I know of, and there is no tree so productive as the Malinda. What do you mean by "tardy bearer?"

Mr. Wedge: Late coming into bearing.

Col. Stevens: I wish to ask the committee if the Tetofsky is put on the second list in consequence of its semi-hardiness. The Tetofsky is the hardiest tree we have in Minneapolis. I know of a tree that was in the way of a house which was to be built, and the tree was taken up and re-set in full leaf without injuring it at all. Certainly, in this neighborhood, the Tetofsky is the hardiest tree I know of. I am speaking now of the neighborhood of Minneapolis.

Mr. Harris: I think it ought to be on the first list until we get an early apple that is better. The Tetofsky has been injured in some peculiar winters we have had. A single tree of the Tetofsky has brought me more dollars and cents than any other tree on my place and as many bushels in proportion. I believe that the Tetofsky ought to be on the first list.

Mr. Gould: Now, I want to say that I believe Mr. Harris is truthful and consistent in what he says in regard to the Tetofsky on his place, but I think it will not apply everywhere. I have been there myself. He has a peculiar situation, and, I think, one of the best to grow half hardy varieties, and I think that is the reason. Now, what he can do there does not apply

all over the state by any means. He grew chestnuts there. I have seen a chestnut tree on his place, and it always grew smaller and smaller year by year. (Laughter). I want to add to that that I have known the Tetofsky and have handled it more than twenty years—I sold many a tree more than fifteen years ago—and I have never seen a tree yet in our county that had produced more than a half bushel of fruit in any one year.

Pres. J. Underwood: I appreciate that this is an interesting subject, but if we go on at this rate we will not get through this fruit list this morning. If you want to change this fruit list, you must do it by motion.

Mr. S. D. Richardson: As a member of that committee, I wish to make a word of explanation. The Tetofsky succeeds in some localities first rate, and I have known trees that bore apples by the bushel. It is not hardy enough. In lots of localities it succeeds, for instance, where a man has a well near by and can give it plenty of water; it succeeds then. Our district is a little different, and I would plant the Wealthy in preference. I think the Wealthy succeeds better with us than the Tetofsky.

Mr. Dewain Cook: I move the Tetofsky be stricken from the list.

Prof. W. W. Pendergast: For a good many years I have planted the Tetofsky, and in eight years I have never got one to bear an apple, and I have never got one through the third winter, and never got one an inch and a half in diameter.

Mr. M. Pearce: I first propagated that as the Russian Crab. I propagated that until I found other varieties that were far superior to that.

Mr. Philips: We never had a man in Wisconsin in whom we had more confidence than in old Uncle Pepper. He said while the Duchess stands 45 degrees of cold, the Tetofsky could stand 50.

Col. Stevens: I do not know how it is in other parts of the state, but in Minneapolis it is as hardy as the oak. I do not think it is a profitable apple. It certainly presents a magnificent appearance. It grows like a green bay tree.

Prof. Pendergast: I think the question is one of moisture in the soil. I think wherever the soil is moist enough the Tetofsky is all right, but in a dry soil it is a failure.

Mr. Elliot: I think there is some confusion in regard to this list. I would like to ask this committee if they have arranged

the list according to productiveness. If they have, a foot-note should be added to the effect that a certain one on the list is not the most productive, at the same time it is adapted to the class in which it is put. If the list were arranged in that way, we should get over this confusion of hardiness and productiveness.

A vote being taken on the motion of Mr. Cook to strike the Tetofsky from the list, it was lost.

Mr. Wedge: We do not want any thing on this list that cannot be obtained in the nurseries.

On motion of Prof. Green the list of the second degree of hardiness was adopted.

Mr. Wedge: "Promising varieties for trial: Patten's Greening, Okabena, Peerless, Repka Malenka, Anisim, Yellow Sweet, Kaump, Gilbert, Brett, Christmas, Blushed Colville, Cross 413, White Pigeon."

Mr. Philips: What Brett do you mean?

Mr. Wedge: The only good one, the red Brett.

Mr. Richardson: I am a nurseryman and raise trees to sell, and I have got my pet hobbies. I am perfectly willing to take all the responsibility in advertising them, and I do not want the society to mention one of them. If I cannot introduce what I have to sell myself let them go down. I do not believe as a society we ought to mention a single variety that is exclusively controlled by one man. I do not believe there is a person here who wants the society to do that, and I opposed it last year and I oppose it this year.

Mr. Clark: What variety do you refer to?

Mr. Richardson: I do not refer to any variety.

Upon motion the list was adopted.

Mr. Wedge: "Best crabs and hybrids for cultivation: Virginia, Martha, Whitney, Early Strawberry, Minnesota, Sweet Russett, Gideon's No. 6, Briar Sweet, Tonka, Powers."

Mr. Cook: Have you any other name for Gideon's No. 6?

Mr. Wedge: I think very strongly it is the Mary.

Mr. M. C. Bunnell: Did you leave the Hyslop out on account of blight?

Mr. Wedge: Yes, we left it out on account of its blighting so badly.

Col. Stevens: I should like to ask the chairman of the committee whether the Transcendent, the poor man's apple, is left out in consequence of blighting. You can travel for miles and miles over our Western prairies and see nothing but Transcend-

ents. I have always had to fight to keep it in, and I leave it to the society whether it shall be kept in or not; but if you could travel over the Western plains you would recognize that it is a godsend to the poor people—the only thing they have in the shape of an apple is the Transcendent.

Mr. Wedge: The Transcendent has been left out for that reason, and the Virginia is so far superior to it in every way. The Transcendent has done very much to defame the name of apple growing in Minnesota.

Col. Stevens: Dr. Vanderburgh had the Virginia here thirty years ago, and if it takes thirty years to find out the good points of an apple we might as well stick to the Transcendent.

Mr. Smith: In the travels of this committee last summer they undoubtedly saw various fruit trees in bearing, and I would like to ask what per cent, in the judgment of the committee, of the crabs they saw in bearing in the state, were of the varieties in the list or Transcendents and Hyslops.

Mr. Wedge: I will say in the first place that this committee has not made up this list from its experience of this summer alone by any means. So far as seeing these two varieties in bearing, I did not see a Hyslop in bearing anywhere, and I do not remember seeing a Transcendent in bearing anywhere. I grant that there are more Transcendents raised than any other single variety of apples in the state. We are offering this list as a guide to planters. I find it universal where they have both varieties of crabs they prefer the Virginia, and from the general experience we have offered this variety as an improvement over the Transcendent.

Mr. Harris: For a few years past the Transcendent has done better in our part of the state than any other variety. I am safe to say I had more Transcendents on my place than anybody in Houston county. I think the Virginia is certainly a better tree, and better throughout, and I think it is best to leave off the Transcendent.

Mr. Pearce: We have a pesthouse for the removal of cases of small pox, and if we have got any Transcendents in our orchards we ought to have a pesthouse to put them in as soon as they blight, or they will contaminate the whole orchard. I am top-working it now, and I think I can prevent the blight. If I can do that, I shall stick to the Transcendent.

Col. Stevens: I have stood up for the Transcendent year after year. There is one thing, you cannot take it away from the people of the plains; they will buy the Transcendent, if they can get it.

Mr. Philips: We in Wisconsin, especially in the northern part, watch your fruit list closely. Your former president, Truman L. Smith, made a statement at your annual meeting fifteen years ago that was worth \$1,000 to me. He said in St. Paul the Virginia sold at one dollar per bushel when the Transcendent sold at fifty cents a bushel. We are watching your list closely. I think the Virginia is an advance over the Transcendent.

A motion made by Mr. Barrett to place the Transcendent on the list was lost.

On motion of Mr. Pearce the list was adopted.

Mr. Wedge: "Crabs and hybrids for trial: Dartt, Greenwood, Pride of Minneapolis, Crampton's No. 3."

Mr. Harris: I move to strike out the "Minneapolis" part.

Col. Stevens: That tree was introduced by Mr. Wyman Elliot, and it is known as the Pride of Minneapolis, and I am not in favor of striking it out because Mr. Elliot named it.

Mr. Harris: If the trees could be still obtained I would make a motion to place it on the first list. It is the most profitable crab I know of.

Mr. Pearce. There are two profitable crabs left off. I move the Powers be placed on the first list. It is one of the finest crabs I know of, but it is not generally known.

A vote being taken, the motion prevailed.

On motion of Mr. Somerville, the list of crabs and hybrids for trial was adopted.

Mr. Wedge: "Plums. Best for general cultivation: Desota, Forest Garden, Weaver, Cheney, Wolf River.

On motion of Mr. Elliot the list was adopted.

On motion of Mr. Harris the Rollingstone was added to the list.

A motion by Mr. Harris to add the Hawkeye was lost.

Mr. Wedge: "Most promising varieties for trial: Rockford, Wyant, Ocheeda, New Ulm, Stoddard, Surprise, Mankato."

On motion of Mr. Elliot the list was adopted.

Mr. Wedge: "Grapes: Concord, Delaware, Moore's Early, Worden, Agawam, Brighton, Janesville."

On motion of Mr. Elliot the list was adopted.

Mr. Wedge: "Raspberries: Red varieties; Marlboro, Turner, Cuthbert, Brandywine.

"Black and purple varieties: Ohio, Palmer, Nemaha, Gregg, Schaffer, Older."

On motion of Mr. Somerville the list was adopted.

Mr. Bunnell: How about the Philadelphia? It is a good kind, and it is very popular among the people.

Mr. Philips: Do you make a recommendation for trial?

Mr. Wedge: We make no recommendations for trial. They are all cheap plants. They cost but a few cents anyway. If we made out any list for trial, it would be a long one.

On motion of Mr. Elliot, the Souhegan was added to the list.

Mr. Brackett: I should think the Hansell ought to be added to the list.

Mr. Wedge: "List of blackberries: Ancient Briton, Snyder."

On motion of Mr. Smith, the list was adopted.

Mr. Elliot: While we are talking about blackberries, in the Wisconsin report we have two kinds of blackberries under the name of Ancient Briton and Briton, and one is earlier than the other, and they have decided to name one the Badger in place of Briton. I think we have two varieties here under the name of Briton and Ancient Briton.

Mr. Pearce: There are two varieties of blackberries, and they both went under the name of Ancient Briton. One was named last winter the Badger blackberry.

Mr. A. H. Brackett: We have the variety in this county, and it resembles the Snyder.

On motion of Mr. Elliot, the Badger was added to the list.

A motion by Mr. Johnson to add the Taylor to the list of blackberries was lost.

Mr. Smith: I have the Taylor growing in the same row with Ancient Briton and Snyder, and with me it is nowhere near as good as either one of the others. I should object to putting it on the list.

Mr. Harris: My experience with the Taylor is that I do not want it.

Mr. Wedge: "Currants: Red Dutch, White Grape, Victoria, Stewart, Long Branch Holland, North Star."

Dr. M. M. Frisselle: I move the old Red Dutch be stricken off.

Mr. Elliot: I beg leave to differ with my friend Frisselle about the Red Dutch. There may be some varieties that are doing better on his soil. He has a peculiar soil, but on a sandy prairie soil the old Red Dutch will produce as much as anything we have.

Mr. Dewain Cook: The Red Dutch is the best kind we have in Minnesota today.

Mr. Somerville: I have nothing on my place that does better than the Red Dutch.

Dr. Frisselle: I object to the Red Dutch because it is a poor currant and does not sell as well as other currants. The Stewart Seedling will bring a dollar a bushel more than the Red Dutch, and I think it should be cultivated rather than the Red Dutch. I do not believe, because the Red Dutch has been cultivated a long time and has been grown a long time, we should continue it on the list.

Mr. Elliot: I furnished Dr. Frisselle the Stewart Seedling and some other varieties, but on account of its short bunches it will not produce as much as the red Dutch.

Prof. Pendergast: I fruited one year about eight different kinds. There is not one left but the Red Dutch. They were planted on a sandy subsoil, and I am satisfied that on the prairie west of us there is nothing in the shape of currants that will do as well as the Red Dutch.

Mr. Pearce: To strike out the Red Dutch from the list of currants would be like the play of Hamlet, with Hamlet left out.

Mr. Richardson: In our part of the state the Red Dutch is ahead of anything else.

Mrs. E. B. Crooker: We had a great many Red Dutch, but a leaf blight attacked them, and the leaves all dropped off, and a great many were left without a leaf on the bush, and a large amount was lost. Mr. Satterlee had some Red Dutch, and he dug them all up.

On motion of Mr. Elliot, the list was adopted.

Mr. Wedge: "Gooseberries: Houghton and Downing."

On motion of Mr. Smith, the list was adopted.

Dr. Frisselle: We used to see a large gooseberry exhibited by a man from Richfield; I want to know if that is a good kind.

Mr. Elliot: I suppose he has reference to the exhibit of the Triumph gooseberry I made at the summer meeting. That has been on my ground only three years. This year is the first year it has come into bearing to any extent, and if it continues to bear as well as it did this year I shall be in favor of recommending it for cultivation, but for the present I should recommend it only for trial. The Downing is not adapted to sandy soil. The Houghton will do well on sandy soil or on clay soil. While some object to its size, it has a fineness of quality you cannot obtain in the larger gooseberry.

On motion of Mr. Harris, the Triumph and Red Jacket were placed on the list of gooseberries for trial.

Mr. Harris: The Red Jacket is an enormous berry and is larger than the Downing.

Mr. Cook: Will it have to be covered in winter?

Mr. Harris: I saw it bearing enormous crops, and I think it will stand the winter without covering.

Mr. Wedge: "Strawberries. Pistillate: Crescent, Warfield, Haverland. Staminate: Bederwood, Capt. Jack, Wilson.

Mr. Wedge: It seems to me we ought not to add anything to this list of strawberries unless it is successful and doing well. A list of strawberries that are really profitable and valuable all over the state is what we want in this short list.

On motion of Mr. Harris, the Enhance was added to the list.

On motion of Mr. Brackett, the Lovett was added to the list of staminate varieties.

Mr. Pearce: I would put them on the list so they could be tried. Let them be put on the list for trial, and then we will know whether they are good or not.

A motion by Mr. Bunnell to add the Parker Earle was lost.

Mr. Wedge: "Valuable native fruits for trial: Dwarf Juneberry, Sand Cherry."

On motion of Mr. Smith, the list was adopted.

REPORT OF DELEGATE TO NORTHEAST IOWA HORTICULTURAL SOCIETY.

O. M. LORD, MINNESOTA CITY.

As a delegate from this society, I had the honor of attending the meeting of the Northeast Iowa Horticultural Society held at Hampton, Nov. 26 and 27, 1895.

At the opening session the first business transacted was the cordial recognition of your delegate and his election as an honorary member of their society.

The regular program was then taken up, and closely and successfully followed to completion.

The society is organized into four districts; viz:

J. B. Mitchell, of Cresco, director of the first; C. F. Gardner, of Osage, director of the second; S. W. Ferris, of Bristow, director of the third; C. H. True, director of the fourth.

Mr. Mitchell said that apples in his district last year were nearly a failure. There were a few Oldenbergs, Wealthys and some Russians. The yield was mostly from the eastern part of the district. Small fruits nearly all failed and blackberries entirely, probably caused by the excessive drouth of 1894. Strawberries could not be considered in good condition for the coming year, the ground being unusually dry. A few pear trees fruited lightly, but all the trees were badly blighted. The sand cherry was, in his opinion, of no value as a fruit. Nursery stock had made fair growth.

In the discussion following the report, blackberries were considered a failure from having formed no fruit buds. Mr. Reeves would recommend the Recumbent apple as bearing well, notwithstanding frost and drouth.

Mr. Gardner reported frost in his district as very destructive to all small fruits; they did not suffer so much from drouth, but the cut worms and white grubs were very destructive to all small plants. The remedy suggested was deep plowing late in the fall.

There was very little leaf or twig blight this year except with pear trees. Where orchards were well grown, they were well set with fruit buds for next year. He regarded irrigation as too expensive and unreliable with wind power, and a reservoir as impracticable. The better remedy for drouth was deep plowing in the proper season and then thorough cultivation. President Burnap and Mr. Bixby were of the opinion that gasoline engines would not be satisfactory for raising water, as they would require an expert for their management. Mr. Van Houten said irrigation was practicable where gravitation could be used, but even then would not be found profitable in Iowa for general crops. It might be used to advantage for celery or for other special crops.

Mr. S. W. Ferris reported fruits a general failure on account of frost; near Hampton some orchards bore fruit; evergreens suffered materially, though escaping in some places. The balsams stood better than white pine. Mr. Mitchell said the arbor vitæ in hedges was nearly all killed, but standing alone escaped.

Mr. C. H. True reported from the fourth district. On an average for the whole district, fruits were a failure this year; what little was grown brought a good price. The Cuthbert raspberry was hardy and productive. Grapes were frozen in May, but a good crop was grown. Plums did very well; the early varieties were most profitable. Spraying must be resorted to, to be sure of fruit.

Reports of the secretary and treasurer indicated that the society was flourishing and its business matters in good condition.

Edson Gaylord's paper, "Site and Preparation of an Orchard," elicited much commendation.

He would not set an orchard on new land without previous cropping. All soils needed to be deeply plowed and highly manured. For setting trees he would open trenches with the plow and set in regular rows; then mulch the trees at least four feet, and cultivate the ground every week during the growing season. If planted on sloping ground, he would cultivate crosswise and not up and down, for fear of forming gullies in case of heavy rains. He believed the site to be of more importance than the selection of particular varieties, and would reject a subsoil of sand or of impervious clay, and would select any of the high prairies with clay loam soil, and under no conditions would attempt to make an orchard on low ground. He referred to several successful orchards on high land and several failures on low land, where soil and other conditions were, to all appearances similar, except as to altitude. The famous orchards of Waupaca county, Wis., and that of Mr. Philips, of West Salem,

were on high land. In Minnesota the orchards of Mr. Harris, Mr. Somerville, Mr. Keel and others were on high land. Even the standard varieties, the Duchess and Wealthy, would not succeed on low ground. The high, rich clay loams about Clear Lake are very successful; also the higher lands of Michigan, the altitude making a difference in temperature. Close protection by other trees is invariably detrimental.

A paper on "Varieties and Planting" was read by J. M. Elder, of Concord. He would not recommend new or untried varieties for general planting. They must be tried for a series of years and known to be reliable. He had experimented more or less for his own information and pleasure and could only recommend so far as he had met with success on his own place, where he was acquainted with all the conditions. The reliable apple list was short; it included such as the Oldenburg, Wealthy, Recumbent and Iowa Beauty. He had also forty varieties of Gideon's seedlings. They had all borne fruit. The trees were healthy and hardy, and the fruit in size and quality not above the ordinary crab apples. Out of numerous varieties of plums, the Desota, Wolf and Miner had succeeded best. Could not recommend cherries, and pears, though growing thriftily, were killed by blight before bearing. In planting he would use great care to protect the roots of trees while being transferred, would nicely trim roots and top, place the roots in mortar to prevent drying and plant two inches deeper than standing in the nursery; put them in deep, moist, rich soil and heavily mulch, removing the mulch from near the stem in the fall for fear of mice. Rotten straw was the best mulching he could use.

"Care of an Orchard," Mr. Haviland. Could not hope for success, without a good location, good trees and thorough cultivation; would sow buckwheat and not cut, but leave it on the ground; would not water the trees.

Question: Why would not Eastern varieties thrive here?

Answered by Mr. Watrous: Because they were grown under different conditions of temperature. They originated in a moist atmosphere compared with ours. The rains and abundant snow saturated the soil, which did not freeze like ours. He believed all fruits were more likely to prove successful in the place where they originated or when surrounded by similar conditions of climate and soil.

Mr. Van Houten said origin cut no figure in the success or failure of fruits; it depended wholly upon environment and whether they were adapted to a change of location. California and the Pacific coast produced some fruits in greater profusion and of better quality than they were grown where they originated. This was also true of ornamental plants taken from India to the Sandwich Islands. The natural character of the plant, habits of growth, conditions surrounding it, of moisture, temperature and soil determined its adaptability to a particular location without regard to where it originated.

Discussion: Our trees need special protection from sunscald, rabbits, insects, enemies, etc. Several well known remedies were suggested, thorough cultivation being the most important.

Question: Is top grafting desirable for Oldenburg and Wealthy? The opinion prevailed that they were equally as good when grown on their own stems, but the Wealthy was more liable to sunscald with a long stem than when grown with a low top.

Mr. Wells said his orchard was in fine, thrifty condition; it was set nine years ago and had been highly manured and thoroughly cultivated every year and till this year had produced fruit in great abundance.

The program for the evening session was carried out, and the papers read indicated a thorough knowledge of the subjects and a careful preparation. They were well received, though not calculated to provoke discussion.

The fruit exhibit. Of apples, twenty-five or more varieties were shown by Mr. Ferris and received marked attention. Among them were the Oldenburg, Allen's Choice, Fameuse, Iowa Blush, Pewaukee, Wealthy, Plumb's Cider, Recumbent, Kaump, Willow Twig, Walbridge, St. Lawrence, Golden Russett, Talman Sweet, Whitney, Louvers, Perry Russett, &c.

There were also several varieties of canned fruits.

Officers elected for the coming year: J. C. Ferris, President; C. F. Gardner, Vice-President; C. H. True, Secretary; G. A. Ivins, Treasurer.

The next annual meeting will be held at Osage.

Wednesday session. Committee reports of small fruits and plums were read. The general tenor of these was that the last year was exceptional in frosts and drouth, though a fair crop of grapes and plums was gathered. There was some discussion in regard to the desirability of different varieties, which, without noting the discussion, will be indicated by the vote on the list to be recommended. The society as a whole does not present a list to be recommended for general planting; instead, a committee is appointed to present a list to be voted on, showing individual experience and opinion of desirability for general planting. The vote was taken by uplifted hands, and the questions were: first, "How many have tried the variety?" second, "How many would recommend it?"

No discussion is allowed. This method is quick and satisfactory and gives those who desire to plant an opportunity of judging for themselves what they would select. Several members were absent when this vote was taken, but the proposition for and against would probably be maintained by a full vote.

In the following list, the detail of the voting is omitted and the names given of those varieties only that were recommended by a majority of those voting.

APPLES.—Oldenberg, Wealthy, Walbridge, McMahon, Kaump, Hibernial, Borovinka, Antonovka, Charlamof, Whitney, Tetofsky, Yellow Transparent, Martha crab, Bailey Sweet, Iowa Beauty, Patten's Greening, Longfield, Roman Stem, Allen's Choice, Utter's Red, Yellow Sweet, Iowa Blush, Minnesota.

CHERRIES.—Early Richmond, Wragg, Cerise de Ostheim, Minn. Ostheim, Montmorency, Rocky Mountain, Sand Cherry.

CURRENTS.—Victoria, Red Jacket, Long Bunch Holland, White Dutch, White Grape, North Star.

PLUMS.—Desota, Wyant, Hawkeye, Forest Garden, Miner, Stoddart, Forest Rose, Rockford, Bixby, Gaylord, Cheney, Wolf.

GOOSEBERRIES.—Houghton, Downing, Columbus, Golden Prolific Tetonka, Big Bob, American Wild, Lee's Prolific.

GRAPES.—Concord, Worden, Moore's Early, Janesville, Green Mountain, Delaware, Agawam, Brighton.

RED RASPBERRIES.—Turner, Kenyon, Shaffer, Golden.

BLACK RASPBERRIES.—Gregg, Ohio, Older, Nemaha, Palmer, Kansas, Eureka.

STRAWBERRIES.—Crescent, Warfield, Bederwood, Haverland, Parker Earle, Robinson, Shuckless, Greenville, Enhance, Wolverton, Gardner.

BLACKBERRIES.—Snyder, Ancient Briton, Agawan.

JUNE BERRIES.—Success, Dwarf.

Wednesday afternoon. Reports of delegates were heard to and from Minnesota, Wisconsin and the Northwest Iowa Society.

These reports were given careful attention and covered much ground outside of the regular work of the society and make a valuable addition to their horticultural records.

At the evening session, several papers were read of great literary merit, the subjects being treated with clearness and comprehension, and they were highly appreciated by all present. The session was also enlivened by excellent music. At the request of the president, Mr. Van Houten gave an informal talk upon the horticulture of the Sandwich Islands, India, China and Japan, also slightly comparing their social relations to those of our people. He had personally visited these countries and parts of Europe to gain horticultural knowledge and to satisfy himself as to whether there was a more desirable abiding place.

He had come back to Iowa perfectly satisfied to remain, with no desire to go beyond its boundaries, as he knew by personal observation that no more contented, thrifty, intelligent and prosperous people lived on the face of the earth than were to be found in "our own free and happy homes." The audience was treated to one of the most vivid, beautiful and interesting oriental pictures of some of those tropical regions where nature had lavishly bestowed in perennial beauty the most gorgeous coloring on shrubs and flowers, and had scattered in endless profusion many of the choicest fruits, with a climate of perpetual summer and harvest. And yet the background of this picture, representing the social condition of large classes of the people of India and China, was revolting to all our ideas of christianity, virtue, happiness or pleasure. Some of their ornamental plants are very desirable, but with the exception of some of the citrus fruits of Japan, he would not give one of the apples of Iowa for all the fruits of the tropical regions, and, finally, he would not exchange one of the happy homes of Iowa for any other abiding place to be seen in all his travels.

NOTES FROM THE FIELD.

BY CLARENCE WEDGE, HORTICULTURIST OF THE MINN. FARMERS' INSTITUTE.

(This I understand to be the first of a series of notes that Mr. Wedge will contribute. They will furnish very reliable data as to the fruit growing interests in the institute route and will be appreciated. Secy.)

Thinking that some of the explorations and observations of a traveling horticulturist might be of interest to the society and of some value as a matter of record, I will, with our secretary's consent, make some notes for publication.

The next day after the adjournment of our winter meeting, I joined the institute corps at Redwood Falls, where I was rather too late to do much the first day but was able to address them on the subjects of "Small Fruits" and "Orcharding" the second day. I found, that while they listened with marked attention, the severe drouths of the past seasons had discouraged those who had attempted small fruit growing and that there was the usual skepticism in regard to apple growing of any kind.

I was much interested in making the acquaintance of Mr. H. W. Nelson, of Vernon Centre (near Mankato), who has been planting apple trees in Minnesota for forty years and who has attained quite a degree of success. He has trees of Tetofsky, Wealthy, Duchess and Whitney about twenty-five years old, Fameuse twenty years old and trees of what may be the Hibernial and Longfield twenty years old. The latter two Russian varieties he bought of the Moulton nursery and had no idea of their true names, as at the time of purchase Mr. Moulton would not give them to him. I had a few specimens of the Hibernial with me, and, after examining and tasting them, Mr. Nelson was quite sure that they were the same as his. While his trees are generally doing well, he reports the Whitney as the heaviest bearer and best variety he has.

One of the leading horticulturists about here is Geo. Whittet, living about one and one-half miles west of the city, who has had considerable experience with small fruits. I was surprised to find so many good apple and crab trees scattered through the city. G. S. Richardson has some seven trees of crabs and apples that have produced at least one hundred bushels of fruit in the past few years. Some of the crab trees measure from thirty to forty inches in girth of trunk and are in perfect condition. Several of the seven are standard apples of the Duchess and Wealthy varieties.

Mr. J. W. Ferris has a number of fine trees. One Wealthy, which produced two and one-half barrels of fruit the season of 1892, was in perfect condition, with a girth of trunk of twenty-five inches—a very fine tree standing out by itself on the lawn; a Tetofsky, fifteen inches, in good condition; a Briar Sweet, twenty-three inches, in very perfect condition and a heavy bearer; a Minnesota, twenty-five inches, very high and carelessly trimmed, in excellent condition.

In the yard of Wm. Skinner are two fine trees of the white spruce, thirty-two inches, looking very bright and healthy. In an adjoining yard are four trees of the Minnesota, fifteen inches, bearing about a bushel of fruit each the past season, the trees being in quite perfect condition.

Mrs. P. D. Hitchcock has been one of the largest planters in this section. While she has lost a large share of her trees through improper selection and lack of intelligent care, we found Wealthy, twenty-five inches, in perfect condition; Briar Sweet, twenty-five inches, very healthy and productive; Tetofsky, fifteen inches, not very productive and inclined to scald. This orchard is evidently suffering from drouth, even large soft maples near by having died outright from this cause. Many of the trees are leaning heavily to the north and are, hence, severely scalded.

Mr. N. V. R. Hunter has one tree each of Early Strawberry, forty inches, and Duchess, sixteen inches, that are in perfect health and have been very profitable. He sold \$30.00 worth of fruit from these two trees and a small stub that is scarcely worth mentioning the past season; certainly, a surprising profit to derive from trees that occupy scarcely more than three square rods. But good fresh summer apples are scarce here, and he sold his Duchess @ \$2.00 per bushel, and Strawberry crabs @ \$1.50 per bushel.

The most common injury in this section is the easily preventable one of sunscald; but there is abundance of evidence that drouth is severely felt and taxing the vitality of the trees to the last degree. We would be glad to report more particularly in regard to small fruits, but winter is not a favorable time to make examinations, and nearly all of those whom we meet are unable to give an idea of their varieties or much that would be of value to the society. We were unable to learn of any who were doing anything with grapes or plums.

ANNUAL MEETING OF THE SOUTHERN MINNESOTA HORTICULTURAL SOCIETY, 1895.

HELD AT AUSTIN, DEC., 20 AND 21, 1895.

The third annual meeting of this society closed on Saturday afternoon, having held five sessions, commencing Friday morning. Friday forenoon was devoted to the discussion of the apple question, with addresses on the subject by Edson Gaylord of Nora Springs, Iowa and J. S. Harris of La Crescent. The papers read and discussed during the various sessions were: "How to Grow Celery," N. I. Johnson, Austin; "Small Fruits," John Christgau, Sutton; "Irrigation for Small Fruit," Geo. H. Prescott, Albert Lea; "Keeping Apples," Clarence Wedge, Albert Lea; "My Father's New England Orchard," C. D. Belden, Austin; "Fruits for Winter Use," Mrs. Geo. H. Prescott, Albert Lea; "Mistakes in Orchardng," Edson Gaylord, Nora Springs, Iowa; "Plums," J. S. Harris, La Crescent; "Hardy Fruits for Southern Minnesota," C. F. Gardner, Osage, Iowa; "Orcharding for Amateurs," J. B. Mitchell, Cresco, Iowa; "Girding to Promote Fruitfulness," E. H. S. Dartt, Owatonna; "Influence of the Nurseryman on Horticulture," C. G. Patten, Charles City, Iowa; "Small Fruits and Vegetables—How to Raise Them," G. C. Dinamoer, Austin; "How to Raise Grapes," H. L. Crane, Excelsior. All subjects were fully discussed and brought out much valuable experience.

The following officers were elected for the ensuing year: President, J. C. Hawkins, Austin; vice-president, Jonathan Freeman, Moscow; secretary and treasurer, C. L. Hill, Albert Lea. Executive committee in addition to the three above officers, A. J. French, Windom, and Geo. H. Prescott, Albert Lea,—*Mower County Transcript*.

NOTES.

"Over thirty varieties of fine specimens of Minnesota apples were on exhibition. They came from the nurseries of Clarence Wedge, of Albert Lea, and J. S. Harris, of La Crescent. Over one-half of the varieties shown were winter apples."

"The crowd present at these meetings was not a large one, but among them were about fifty of the leading horticulturists of southern Minnesota and northern Iowa."

"We had quite a successful meeting and feel quite inclined to hope a good deal of our society. We have elected as president. Mr. J. C. Hawkins of Austin, who being well acquainted with the farmers will make, I think, an active canvass for memberships."

Dec. 23, 1895.

F. W. KIMBALL.

"Last Saturday (21st) we finished a most enjoyable meeting at Austin. Harris, Dartt, Mitchell, Patten, Gaylord, Sherman and Gardner and H. L. Crane were with us, and an excellent local attendance. I am sure you will want some of the papers read, as they were rather extra for a local meeting. We made our membership fee \$1.00 in view to take advantage of the liberal offer of the state society. I will send on notes for the meeting for the February Magazine."

Dec. 23, 1895.

CLARENCE WEDGE.

ANNUAL MEETING MINNESOTA BEEKEEPERS ASSOCIATION, 1895.

E. K. JAKUES, SEC'Y, CRYSTAL.

The seventh annual meeting of this association was held in Minneapolis, December 5—6, 1895.

This meeting was one of the most profitable ever held by the society. The papers read treated subjects that were of vital importance to every progressive beekeeper; while the discussions that followed were generally participated in and revealed the fact that Minnesota beekeepers are progressive and keep well informed on all subjects relating to scientific beekeeping.

The subjects more generally discussed were those relating to the size of hive best suited to this locality, and that of *foundation*, especially as to amount that may with profit be used both in frames and in sections. Another interesting paper and discussion was on "What Clovers may be Successfully Grown in Minnesota as Forage Plants and Bee Pastures?" It was clearly shown that beekeepers and farmers alike are not making the general use of alsike and crimson clovers that their interests demand. The crimson clover especially is a stranger to most Minnesota farmers, but the highly satisfactory results of a trial made of it by H. L. F. Witte, a practical beekeeper of Hennepin county, last year shows this clover to be a valuable addi-

tion to the forage plants of Minnesota as well as a fine honey producer.

We were highly favored with a paper from Prof. Lugger, State Entomologist, on the subject, "Is the Queen Hermaphrodite." While the professor is not a practical beekeeper, his intimate knowledge of insect life enabled him to invest his subject with uncommon interest.

As space is limited, I cannot make mention of the other valuable papers and matters that came before the society. It is to be regretted that more of the beekeepers throughout the state are not members of this association. The trifling expense connected with it would be returned to them many fold; for no man who possesses sufficient intelligence to enable him to become a successful beekeeper can attend these annual meetings and not go back to his work, not only a better beekeeper, but a wiser man.

Most beekeepers are to some extent horticulturists. The two societies meet during the same week and at the same place, and most of the beekeepers are members of the horticultural society and the reports alone published by the latter are well worth the price of membership.

I am glad to be able to say to the beekeepers of Minnesota, that, through the courtesy of the horticultural society some of the papers presented at the '95 annual meeting will be published in the near future in their report.

OFFICERS OF THE MINNESOTA BEEKEEPERS' ASSOCIATION FOR 1896.

PRESIDENT.

J. P. WEST,.....Hastings

VICE PRESIDENTS.

C. THEILMANN, First District.....	Theilmanton
MRS. B. J. LIVINGSTON, Second "	Center Chain
GEORGE PERRY, Third "	Farmington
MRS. H. G. ACKLIN, Fourth "	St. Paul
WM. URIE, Fifth "	Minneapolis
J. L. GRAY, Sixth "	St. Cloud
J. M. DOUDNA, Seventh "	Alexandria

SECRETARY.

E. K. JAKES.....Crystal

TREASURER.

L. E. DAY.....Clinton Falls

AWARD OF PREMIUMS

At the Annual Meeting of Dec., 1895, of the Minnesota State Horticultural Society.

APPLES.

Article.	Exhibitor.	Premium.	Amount.
Red Cheek.....	W. S. Widmoyer...	Second.....	\$0.25
Minnesota.....	R. H. Buttermore.....	Second..	.50
Seedling.....	".....	Second.....	2.00
Wealthy.....	J. W. Murray.....	First.....	1.00
Duchess.....	".....	Second..	.50
Whitney.....	".....	First.....	1.00
Briar Sweet.....	".....	First...	1.00
Transcendent.....	".....	First.....	.50
Briar Sweet.....	John Loudon.....	Second.....	.50
Early Strawberry.....	".....	First.....	1.00
Longfield.....	Wm. Somerville.....	Second.....	.50
Red Anis.....	".....	First.....	.50
Striped Anis.....	".....	First.....	.50
Solree.....	".....	First.....	.50
Rollin's Pippin.....	".....	First.....	.50
Tobenovka.....	".....	First.....	.50
Blue Anis.....	".....	First.....	.50
Piqua.....	".....	First.....	.50
Brett No. 1.....	".....	First.....	.50
" No. 2.....	".....	First.....	.50
Antonovka.....	".....	First.....	.50
Sheepnose.....	".....	First.....	.50
Glass Green.....	".....	First.....	.50
Zuzoff Winter.....	".....	First.....	.50
Ohlonka.....	".....	First.....	.50
Tetofsky.....	".....	First.....	1.00
Brownny.....	".....	First.....	.50
Yellow Transparent..	".....	First.....	.50
White Transparent.....	".....	First.....	.50
McMahon White.....	".....	Second.....	.25
Red Black.....	".....	First.....	.50
Enormous.....	".....	First.....	.50
Red Cheek.....	".....	First.....	.50
Rollin's Prolific.....	".....	First.....	.50
Rosefort.....	".....	First.....	.50
Yellow Anis.....	".....	First.....	.50
Perry Russet.....	".....	First.....	.50
Repka Malenka.....	".....	First.....	1.00
Zuzoff.....	".....	First.....	.50
Hibernal.....	".....	First.....	1.00
Rollin's Russet.....	".....	First.....	.50
White Russet.....	".....	First.....	.50
Gideon's No. 6.....	".....	First.....	1.00
Florence.....	".....	First.....	.50
Hyslop.....	".....	Second.....	.25
Akin's Winter.....	".....	First.....	.50
Power's Siberian.....	".....	First.....	.50
Mary.....	".....	First.....	.50
Transcendent.....	".....	Second.....	.25
Sweet Russet.....	".....	First.....	1.00
Collection.....	".....	First.....	5.00
McMahon White.....	J. S. Harris.....	First.....	.50
Borovinka.....	".....	Second.....	.50
Plumb's Cider.....	".....	Second.....	.25
Golden Russet.....	".....	First.....	.50
Solree.....	".....	Second.....	.25
La Crescent.....	".....	First.....	.50

AWARD OF PREMIUMS.

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Scott's Winter.....	J. S. Harris.....	First.....	.50
Daisy.....	".....	First.....	.50
Ostrekoff.....	".....	First.....	.50
Avista.....	".....	First.....	.50
Julia.....	".....	First.....	.50
Pewaukee.....	".....	First.....	.50
Walbridge.....	".....	First.....	.50
Price's Sweet.....	".....	First.....	.50
Blushed Colville.....	".....	First.....	.50
Greene's Golden.....	".....	First.....	.50
Atonovka.....	".....	Second.....	.25
Page's Sweet.....	".....	First.....	.50
Fameuse.....	".....	Second.....	.25
Pride of Minneapolls.....	".....	First.....	1.00
Gibbs.....	".....	First.....	.50
Utter.....	".....	First.....	.50
Russian Green.....	Wm. Somerville.....	Second.....	.25
Kaump.....	".....	First.....	.50
Volga.....	".....	First.....	.50
White Pigeon.....	".....	First.....	.50
Golden Russet.....	Wm. Oxford.....	Second.....	.25
Switzer.....	".....	First.....	.50
Walbridge.....	".....	Second.....	.25
Perry Russet.....	Ditus Day.....	Second.....	.25
Haas.....	".....	First.....	.50
Talman Sweet.....	".....	First.....	.50
Drake.....	".....	First.....	.50
Fameuse.....	".....	First.....	.50
Malinda.....	".....	Second.....	.25
Clara.....	".....	First.....	.50
Meador's Winter.....	".....	First.....	.50
Borovinka.....	J. R. Cummins.....	First.....	1.00
Charlamof.....	".....	Second.....	.50
White Transparent.....	".....	Second.....	.25
Bode.....	".....	First.....	.50
Martha.....	".....	First.....	1.00
Russian Groskal.....	Dan'l F. Aikin.....	First.....	.50
Aikin's Best.....	".....	First.....	.50
Aikin's Pear.....	".....	First.....	.50
Virginia.....	".....	Second.....	.50
Duchess.....	J. A. Howard.....	First.....	1.00
Early Strawberry.....	".....	Second.....	.50
Okabena.....	Jewell Nursery Co.....	First.....	1.00
Orange.....	".....	First.....	.50
Beecher's Sweet.....	".....	First.....	.50
Cherry.....	".....	Second.....	.25
Quaker Beauty.....	".....	First.....	.50
Martha.....	".....	Second.....	.50
Greene Cone.....	".....	First.....	.50
Angular.....	".....	First.....	.50
Meador's Winters.....	".....	Second.....	.25
Pickel's Prolific.....	".....	First.....	.50
Collection.....	".....	Second.....	3.00
Winter Seedling.....	".....	First.....	.50
Litus.....	C. Wedge.....	First.....	.50
Russian Green.....	".....	First.....	.50
White Transparent.....	".....	Second.....	.25
Peerless.....	".....	First.....	1.00
Newell's Winter.....	".....	First.....	.50
Hibernal.....	".....	Second.....	.30
Crampton's No. 2.....	".....	First.....	.50
Elgin Beauty.....	".....	First.....	.50
Good Peasant.....	".....	First.....	.50
Longfield.....	".....	Second.....	.50

Hyslop.....	J. A. Howard.....	Second..	.25
Wealthy.....	L. E. Day.....	Second.....	.50
Haas.....	".....	Second.....	.25
Plumb's Older.....	".....	First.....	.50
Mill's Seedling.....	".....	First.....	.50
Charlamof.....	".....	First.....	1.00
Orange.....	".....	Second.....	.25
Minnesota.....	".....	First.....	1.00
Quaker Beauty.....	".....	Second.....	.25
Sweet Russet.....	".....	Second.....	.50
Hyslop.....	".....	First.....	.50
Malinda.....	Wm. Somerville.....	First.....	.50

JNO. P. ANDREWS.
S. D. RICHARDSON.

GRAPES.

Eaton.....	Gust Johnson.....	First.....	1.00
Ulster's Prolific.....	".....	First.....	1.00
Empire State.....	".....	First.....	1.00
Iona.....	".....	Second.....	.50
Collection.....	H. L. Crane.....	Second.....	3.00
Brighton.....	".....	First.....	1.00
Delaware.....	".....	First.....	1.00
Iona.....	".....	Second.....	.50
Lady.....	".....	First.....	1.00
Roger's No. 15.....	".....	Second.....	.50
Delaware.....	Jno. Loudon & Son.....	Second.....	.50
Moore's Early.....	".....	First.....	1.00
Massasoit, Roger's No. 3.....	".....	First.....	1.00
Worden.....	".....	First.....	1.00
Empire State.....	".....	Second.....	.50
Brighton.....	".....	Second.....	.50
Telegraph.....	".....	First.....	1.00
Iona.....	".....	First.....	1.00
Roger's No. 15.....	".....	First.....	1.00
Collection.....	".....	First.....	5.00
Vergennes.....	Gust Johnson.....	First.....	1.00
Lindley.....	".....	First.....	1.00

E. J. CUTTS.

PEACHES AND PEARS.

Peach No. 7.....	G. F. Flatin.....	First.....	1.00
Peach No. 2.....	".....	First.....	1.00
Pears' Flemish Beauty.....	J. S. Harris.....	First.....	1.00

A. F. COLLMAN.

FLOWERS.

Collection of plants.....	E. Nagel.....	First.....	5.00
Single geranium.....	".....	First.....	1.00
Single begonia.....	".....	First.....	1.00
Single carnation.....	".....	First.....	1.00
Floral design.....	".....	First.....	5.00
Collection cut roses.....	".....	First.....	2.00
Collection carnations.....	".....	First.....	2.00
Table bouquet.....	".....	First.....	2.00
Basket of flowers.....	".....	First.....	2.00

MRS. JENNIE STAGER.

VEGETABLES.

Hubbard squash.....	J. T. Grimes.....	First.....	1.00
Cabbage.....	H. F. Busse.....	First.....	1.00
Carrots.....	".....	First.....	1.00
Beets.....	".....	First.....	1.00
Parsnips.....	".....	First.....	1.00
Celery.....	".....	First.....	1.00
Potatoes, early.....	".....	Second.....	.50

Potatoes, late	H. F. Busse.....	First.....	1.00
Onions.....	"	First.....	1.00
Turnips.....	"	First.....	1.00
Onions	H. L. F. Witte.....	Second.....	.50
Cabbage.....	"	Second.....	.50
Collection potatoes.....	H. L. Crane.	Secend.....	.50
Potatoes.....	J. R. Cummins	First..	1.00
Hubbard squash.....	E. M. Chandler.....	Second....	.50
Sweet potatoes.....	J. R. Cummins.....	First.....	1.00
Lima beans.....	"	First.....	1.00

J. S. HARRIS.

HONEY.

Comb.	Wm. Urle... ..	First.....	5.00
Extracted.....	J. W. Murray.....	Second.....	2.00
Extracted.....	H. L. F. Witte.....	First	3.00
Comb	E. K. Jaques.	Second.....	3.00

C. THEILMANN.

IRRIGATION..

Tile draining, subsoil plowing and irrigation are three conditions of good farming that the tillers of the soil in this state must learn to appreciate. The benefits of their adoption have been so universal that the intelligent cultivator must acquaint himself with them. When he has done so, he will not be slow to adopt them. The subject of irrigation is an old one, dating back 2,000 B. C. It is also a large one; whole volumes having been written on it. The simple fact is that 70 to 95 per cent. of a growing plant is *water*, and that the solid portion of it can enter into it only in a soluble state. Hence, the first great need of all vegetation is *water*, the second is *water* and the third is *more water*. If this is not supplied naturally, it must be artificially. Nature has done her part well in Minnesota in that, about 70 per cent. of the total rainfall comes when most needed, during the growing season from April to September. The average precipitation during that time is twenty inches, fully 75 per cent., or fifteen inches, of which runs off and is evaporated, leaving only five inches available for plant life. You will see that this amount is entirely too little, as twelve inches are required to carry a full crop from germination to maturity. As some practical results of irrigation, the writer has seen five crops of alfalfa "under the ditch" cut in one season, averaging two tons to a cutting; thirty-five bushels of wheat per acre from soil that had but one thorough wetting and no fertilizer; while in England sixty-five bushels per acre is a common yield from irrigated soil.

Admitting the need of an artificial supply, the question arises, how large a stream will answer a given purpose? A stream one inch square flowing at the rate of four miles an hour will cover an acre one inch deep in twenty-four hours. Expressed in gallons, it is 27,245.—Minnesota Weather and Crop Review.

Secretary's Corner.

PLANT PREMIUMS TO NEW MEMBERS.—The same premiums of plants offered to new members in 1895, will be given in 1896. Those who have not yet received them for 1895 will do so the coming spring.

SOCIETY STATIONERY.—A very neat writing paper, note size, has been prepared for the use of the members of the society, and it will be sent postpaid on receipt of 35 cts. per 100 sheets, which is the actual cost. We pay the postage on it gratuitously. Would you not like to use it?

RENEWALS OF MEMBERSHIP.—Something less than one-half of the members for 1895 have renewed up to the time of going to press. As in most cases this is an oversight, set right down when you read this and give it immediate attention and get your name right on the rolls, and at the same time send another dollar for a new member and get Prof. Green's book to study this winter.

PREMIUMS TO MEMBERS.—You will all notice the supplement enclosed offering Prof. Green's "Amateur Fruit Growing," as a premium for securing a new member. You should not fail to take advantage of the opportunity to become the possessor of this valuable work. It answers the very questions that are continually being asked on this subject and from its mode of arrangement is as easy of reference as an encyclopedia. 100,000 copies should be distributed in Minnesota alone. What is the use of walking in the darkness when the light is offered you at such terms?

OFFICERS OF THE IOWA HORTICULTURAL SOCIETY.—At the annual meeting of this society held at Des Moines, December 10-13, there was considerable change in the roll of officers, the new incumbents being for president, F. M. Powell, Glenwood; secretary, Geo. Van Houten, Lenox; treasurer, W. M. Bomberger, Harlan. The retiring secretary, Prof. J. L. Budd, has held the office many years, and to the great advantage of the society. The change made is, we understand, with his concurrence and looking towards the opening of a society office in connection with the extensive library at the capitol.

Alfred's.

HARBOR VIEW, FLA.,
a life member since 1884.

(For sketch of his life, see page 92, report of 1891.)

THE MINNESOTA HORTICULTURIST.

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NO. 2.

ANNUAL MEETING IOWA STATE HORTICULTURAL SOCIETY, 1895.

S. D. RICHARDSON, WINNEBAGO CITY, DELEGATE.

The thirtieth annual meeting of the Iowa State Horticultural Society was held in their rooms in the basement of the capitol at Des Moines. The rooms were tastefully decorated with holly and evergreen vines, and one end of the table occupied by the president and secretary was covered with apples. A large cone, some three feet high, was covered with red and yellow apples on the outside, and a large bowl of American Beauty roses in front of the president was very fine. In the outer room was a large display of plants, roses, chrysanthemums, etc., which attracted much attention.

The display of apples in the basement of the rotunda was very large, some 2,000 plates. The college at Ames had a good display of Russian apples and there were some from Storm Lake. W. C. Haviland, of Fort Dodge, had a table of Duchess, but the bulk of the display was from central and southern Iowa, composed mostly of American varieties. The Wealthy is a summer apple in southwestern Iowa and is not hardy—there seems to be a southern as well as a northern limit to many varieties of the apple. Perhaps this is the reason that the Russians are not more popular in Iowa. The fact that elevation is a factor as well as latitude in determining the location of varieties, was very apparent to your delegate. From the south line of the state of Minnesota 100 miles down hill to the north, there seems little difference in varieties or climate, but the same distance down hill to the south makes a marked change in both.

The meeting was well attended, and there were a large number of nurserymen and persons growing fruit for market present. Space will not permit of even a brief synopsis of the papers read and discussed, and I will only present a few points gleaned while listening with both ears open for something of practical use to us in the North. Mr. W. M. Bomberger read the only paper of the morning session, "Top-grafting the Apple in Commercial Nurseries." His paper was especially valuable for nurserymen. He would mix colors and varieties on the same tree so as to combine beauty and utility in the same tree for village gardens. Discussion brought out the fact that the Haas is very popular as a stock in central Iowa. The testimony seemed to be almost unanimous in favor of topworking for commercial orcharding.

Prof. Budd claimed that what is known as the Virginia Crab is not a crab but the wild apple of Russia and that it came from there to Virginia by the way of the botanical gardens at Kew. At a later

session Mr. Patten stated that it was found growing with the Hewe's Virginia in the nursery of Suel Foster and attracted notice by its superior vigor, and, being asked what it should be named, called it Virginia.

Mr. J. C. Ferris thought the only way that nurserymen could furnish topworked trees to their patrons was by working in the body instead of the limbs. Mr. Watrous found that by leaving some limbs on the stock to grow one year he had better success than by using a clean stem. Others found a clean stem a success by not setting the cion so deep but that the mark of knife would show above the stock, and the union would be perfect in the callous. Prof. Budd claimed that it was contrary to nature to have a naked stem, especially on plums. Mr. Patten works early in March; can graft trees three or four inches through by working in the limbs several feet from the body.

C. W. Mally, the assistant entomologist at Ames, read a paper on "Hibernating Insects in the Orchard." He laid especial emphasis on cleaning up all rubbish and burning it, and cleaning off the rough bark—prevention being better than active treatment in the summer—and jarring and thorough spraying for the curculio. One member found whitewashing in May and September a preventative of borer and rabbits. Strong lye from wood ashes would not injure trees if applied before trees begin to leave out in the spring. Prof. Budd uses strong soapsuds in the summer as a preventative of the borer.

Mr. Kinnie's paper on "Some Common Mistakes in Fruit Growing in the Northwest" contained some hard hits at the class who buy high priced things of the tree agent and generally find themselves humbugged. Ignorance is one of our greatest mistakes. Leave novelties to the experiment station. Mr. Wragg in "Comparative Value of Grape and Cherry Growing in Iowa," while admitting that it might pay to raise grapes, cherries would pay much better, using Early Richmond, Wragg and Dyehouse, and thought by using Wragg on its own roots and the Cerise de Ostheim, Bessarabian, Vladimar, Brusseler Braune, &c., the cherry belt might be extended much farther north. Mr. Patten, of Charles City, where the land is quite sandy, condemned the Russian cherries as not as hardy as the Early Richmond. Capt. Speer, of Cedar Falls, thought that where the blue clay came within fifteen or twenty feet of the top, it would not pay to try and grow cherries.

Mr. Secor in his paper "Unlearning Ones Mistaken Lessons in Horticulture" took the ground that too many things had been endorsed by the society without having been fully tested. The windbreak, if any, should be on the side from whence comes the prevailing winds of summer.

Mr. Patten said that seedlings of hardy trees grown in the South when brought to the North often killed back the first winter but soon adapted themselves to their changed conditions. Elmer Reeves in his paper on "Grape Growing in Iowa" claimed that it would be profitable for Iowa to grow all the grapes she consumed. Too many varieties confuse the farmer. He would plant Wordens, Moore's Early and Concord. Good one year vines are the best, but

two year old vines would answer. He would cultivate shallow and thoroughly, and keep the ground rich. In laying down it is not necessary to cover all up, but be sure to cover the cut portions of the vine.

Prof. Budd found on the college grounds at Ames that Roger's Hybrids when grown with Concord, Worden and Moore's Early were hardy and prolific, but grown by themselves shy bearers and not hardy.

One fact mentioned by Silas Wilson in "New Iowa Plum Culture" was that our best native plums often bring in the markets of Denver and Salt Lake City double the price of the best plums of the domestic type, thus showing their superior value for cooking purposes. Among new plums he would name the Wyant and Hawkeye, but would not recommend any new variety that might be the pet of particular persons to the exclusion of such good varieties as Desota, Forest Garden, Rockford, Wolf, Cheney and many others. He thought the Russian varieties unsatisfactory. Good cultivation and high manuring were a necessity. Mr. Terry would use pits of native varieties for stock; wash them and plant in the fall; bud in August or graft in spring. "Is the Tree Pedlar a Necessity" was the subject of a paper of J. C. Ferris. He did not believe in the plan of agents, but under existing circumstances in this age of sharp competition they were a necessity. Co-operation would be better. There are two classes of agents, the man of two sticks who lives by humbugging the public and the man who is honorable and fair in his dealings.

Capt. Speer's paper "Six Best Facts Learned in Thirty Years Experience" was long and interesting. He thought all soils underlaid with blue clay with some exceptions unfit for fruit growing. All American varieties were worthless root-grafted on such soils, but the most of them could be successfully grown topworked on Virginia Crab. Thaler, Repka Kislaga, Vassil's Largest, Resonant and Gipsy Girl could be successfully grown root-grafted on our poorest orchard soils. Others of the Russians were very promising. Of Russian cherries he had found No. 23 Orel, Spate Amerelle and Brusseler Braune hardy and productive. Apple orchards in heavy bearing should be manured and mulched. Three years ago a row of old Fameuse trees that had been previously manured heavily was mulched with spoiled clover hay from six to eight inches deep, and last year a large crop of smooth, well developed apples was picked from them which will keep several months longer than the little starved Fameuse apples which grew on trees where the ground was neither manured nor mulched.

One thing was noticable in the discussions and papers: Some persons who seem to have had good opportunity for knowing all the facts in the case place the Russian varieties of fruit far ahead of our American varieties as far as hardiness and general desirability are concerned, while others, equally good authority, would reject everything Russian, proving to the satisfaction of your delegate that where a person uses good judgment in the adaptation of varieties to soil and climate both are desirable.

The committee on fruit awards reported awarding nearly \$500 in premiums on fruits and flowers, mostly on apples. Several amendments to the constitution were adopted, and hereafter only those who have been members two consecutive years previous to election will be entitled to vote, except life members, who can vote without being affected by the time limit.

Geo. H. Van Houten gave an interesting talk on "Foreign Horticulture." Space fails us to mention all the good things that were crowded into the three days of the meeting, but any one can obtain the whole thing and much more with it by sending \$1.00 to Geo. H. Van Houten, the secretary elect, at Des Moines, Iowa.

In conclusion, your delegate wishes to return thanks for the kind and courteous treatment that he received while attending the meeting.

THE BLACK RASPBERRY.

W. J. HOPKINS, BLOOMINGTON.

Looking at small fruit growing from a purely commercial standpoint, laying sentiment and professional love for accomplishment in this line aside, taking the business in a business way, there is ample ground for encouragement and a wide margin for success to the patient, careful planter and active, industrious cultivator of small fruits. I have not the time nor ability to do more than record a few observations and crude remarks, for which I ask your patient hearing and lenient criticism.

I have selected the black raspberry (*Rubus occidentalis*) as perhaps the best known and least regarded by our planters in the list of small fruits at home and entirely successful in this climate. I believe there are no specialists and few large planters of the "blacks" tributary to this market; while the fact is that of the whole list of plants cultivated for market, either vegetable or fruit, the black raspberry comes very near the first place in possible profit, in ready sale and in easy transportation. What variety shall I plant? Well, in case you go to the experimental farm or to the catalogues, you are apt to be bewildered with the strong recommendations of many varieties. If you go to the central market or to the commission houses, the case is different. There are only two varieties offered for sale in any amount, viz: the early, jet black, shiny Souhegan and the large, late, meaty Gregg, when grown under favorable circumstances so covered with bloom as to change the color from black to a blue gray. Of all our Northern grown berries there are none that delight the heart of the weary, sun-bathed berry picker as a well cared for field of Greggs. Three hundred pint boxes are occasionally harvested by a nimble fingered picker in one day.

Which are the most profitable? At Brierfield the Souhegan is a favorite as a money maker. \$3.00 per case of twenty-four pints is the rule for early berries, and we get all our Souhegans off before the Greggs come on. Walter Finch, of Eden Prairie, brought some fine Ohios to market last year. Their season is intermediate. Perhaps the best late berries shown last year were from Long Lake—

up there we have some progressive berry men. They have tried many different kinds but have not shown us any large amounts of the newer varieties as yet.

Let me say right here to encourage the prospective planters, and to any one present who is undecided as to what crop he may plant that will pay in money and also in solid satisfaction, plant an acre of black raspberries in rows wide enough apart each way to cultivate with a horse cultivator, viz, from five to seven feet. Plant in May in good soil, care for them as the good gardener does for a crop of cabbages, and in October following the ground will be so covered with the beautiful bloom-covered brambles that you will have to pick your way carefully to walk through your plants without many sharp scratches. Now cover carefully and next spring uncover tenderly and trim closely, and fifteen months from planting them you can take a load to market that will sell at sight and delight seller, buyer and consumer.

DISCUSSION.

President Underwood: This paper is now open for discussion. Are there any questions to ask, or remarks to offer?

Mr. J. P. West: How far apart should they be planted?

Mr. Hopkins: From five to seven feet.

Mr. West: Why do you say from five to seven feet?

Mr. Hopkins: Well, it depends on the soil.

Mr. Wyman Elliot: In sandy soil about five feet, and seven feet in clay soil.

Mr. Hopkins: Yes, it all depends upon the ground.

Mr. Elliot: Is there any gain in crowding the plants?

Mr. Hopkins: Yes, I think there is.

Mr. J. S. Harris: I am one of those fellows who think it is a great waste to plant raspberries as far apart at the start as they are to remain in after years, and we make a practice of setting the plants in rows three feet apart and the rows four and a half feet apart, and then take good care of them and cultivate one way only. I think that is better than to cultivate both ways. That is my honest opinion; it is better to cultivate only one way with the horse cultivator. We get a good growth of plants and a large amount of berries, and the first year after fruiting we take out every other row. As I said, we get a good growth of plants so the ground is literally covered, and the next spring we cut back pretty severely, and we get a good crop of berries off the patch the first year. Where we plant so far apart the first year, it is customary to put some catch crop between, but three or four times it was injurious to the crop. Some plant sweet corn between the rows; I would not put in sweet corn. I ruined a patch one year by planting corn be-

tween the rows. After the crop is harvested we dig up every alternate row, which leaves the rows nine feet apart, and the next year we get a good crop from the plantation—probably a full crop the next year—while if you put them five feet apart or six feet, they are too far apart to get a full crop the first year, and you waste the use of the land. Our land is not a very strong soil, and we need them further apart than most people. When the plantation stands with the rows nine feet apart and the plants three feet in the row the first year, you get only half a harvest, while, if the rows stand four and a half feet apart, you get a full crop the first year you pick.

Mr. C. Wedge: What varieties do you specially recommend, Mr. Hopkins?

Mr. Hopkins: The Souhegan and the Gregg.

Mr. Harris: Don't you think the Palmer is a better berry than the Gregg?

Mr. Hopkins: I am not prepared to discuss that point. We grow the kind for which we can find the best market.

Mr. C. L. Smith: Mr. Hopkins, how do the black raspberries compare with the red so far as profit in sales is concerned?

Mr. Hopkins: Very little difference. The first reds bring the highest price, and after that there is little difference, but altogether I prefer the black raspberries.

Mr. J. P. West: Did you say there was more money in black raspberries than in reds?

Mr. Hopkins: I did not say so; but I find it is in my own case. I get a greater yield in boxes from blacks than from red from the same amount of ground.

Mr. Elliot: What is your soil?

Mr. Hopkins: Very heavy black soil.

Mr. Elliot: Are you on the Minnesota Bottoms?

Mr. Hopkins: No, it is high.

Mr. Brackett: Is there a black raspberry earlier than the Souhegan? I know the early blackcaps bring the better prices.

Mr. Hopkins: The first black to come to the market are the Souhegan; they are always the Souhegan.

Mr. Harris: There is an earlier variety than the Souhegan.

Mr. Smith: The Palmer has not been generally cultivated in this part of the country.

Mr. H. M. Lyman: How do the blackcaps and the red raspberries compare as to hardiness?

Mr. Hopkins: I do not think there is much difference.

Mr. West: Do you cover with earth or hay?

Mr. Hopkins: Earth, always.

Mr. West: What time do you cover them.

Mr. Hopkins: About October 20th this year. I would not cover them until the first of November if I were sure the ground would not be frozen. The canes are more pliable after a little freezing.

Pres. Underwood: How do you lay them down?

Mr. Hopkins: Draw them down. We always cover them with spades. We cover the canes over entirely. We bend them clear over and then cover them. This year we used the spading fork.

Mr. Wedge. Do you bend them in the cane.

Mr. Hopkins: In the cane. They will not stand bending in the root. With blackberries it can be done.

Pres. Underwood: Can't it be done with raspberries?

Mr. Hopkins: It can't be done.

Mr. Wedge: I should think those young canes would break off.

Mr. Hopkins: We always pinch off the tips of the young black raspberries and they throw out shoots, and then we divide the hills and lay the shoots the way they lean. Blackberries are more upright than the Souhegan raspberry.

Mr. E. J. Cutts: Don't you cut them back.

Mr. Hopkins: A little in the spring. If we want them to propagate, we cut them in the spring to make them sprout; we never touch them in the summer.

Pres. Underwood: Do you hold up the vines in any way?

Mr. Hopkins: No, we cut them back enough in the spring so we don't need to hold them up. Occasionally we do, but we get out of it if we can. I think the wind whips them worse where they are staked. The laterals on the old canes are about eighteen inches long, and if they are staked it generally breaks them right off, but if the old canes are allowed to swing it saves them considerably. I had such an experience a year ago last June; the wind pounded them very badly.

Pres. Underwood: That is one reason why they require so much room, to allow them to spread out.

Mr. Hopkins: Yes, that is one reason.

Mr. West: How many quarts do you get to the acre?

Mr. Hopkins: Can't tell you.

Mr. West: About how many?

Mr. Hopkins: I can't tell you without looking up my books.

Mr. West: About three thousand?

Mr. Hopkins: Well, I can tell pretty nearly by figuring a little.

Pres. Underwood: I would like to extend the thought of Mr. Hopkins in regard to planting close together and then taking them out. It is a good plan where they are grown for market purposes. The last two years we have adopted the plan of doubling the rows; instead of planting them seven feet apart in the first place, we have planted the rows three and a half feet apart and three feet apart in the row. The next year we get our first crop. So far as we have gone, we like the idea very well. We ought to have a full crop of berries off of ten acres next summer, that being the first crop, and there being double the number of plants to the acre. Then we will plow up one row after next summer's fruiting and thin them out. The vines occupy the ground, and I like that better than planting some other crop between the rows. However, that is an experiment that has not been fully worked out to the end, and it may be that it will not be satisfactory, although it looks as if it would be now.

Mr. Elliot in looking over our plants over this summer suggested to me a good idea, and that was in planting black raspberries, if one could get the plants cheap enough—and, if they are bought in quantity, it seems as though they might be had cheap enough—and that was to put in two plants to the hill, so as to insure against possible loss. It is always best to have the ground occupied, and if there is a missing hill—as is frequently the case—there is just that much ground wasted. If you put in two plants to the hill, you are almost sure of one growing. I don't know yet how it will work, although we shall try it next year. I told Mr. Elliot it was an excellent argument in the interest of the nurserymen who had plants to sell.

Mr. West: How cheap should we get them?

Pres. Underwood: It depends upon the quantity you buy. Market gardeners buy them in large quantities, and, of course, get them very much cheaper than if bought in 50 or 100 lots. The price varies from \$3.00 to \$15.00 per thousand.

Mr. E. J. Cutts: Mr. E. P. Roe recommended that plan fifteen years ago, and I have followed it.

Mr. Harris: There is one other advantage in close planting, you get a full crop the first year. You get better raspberries from those young plants, larger berries, more juicy and better looking. The first crop will give you a better quality of fruit than any you get in succeeding years.

Mr. Brackett: Do you raise two crops after setting them out?

Mr. Hopkins: We raise only one crop.

Mr. West: What do you do with them?

Mr. Hopkins: We throw them away.

Mr. A. J. Philips: Four years ago at Lake Okabena I found some black raspberries that I thought were bearing very early, and I took some up, and when I came home I propagated them and compared them with the berries at Sparta, and they were seven days earlier than Mr. Thayer's. We had no name for them. I would like to know if there is anyone here who has fruited it and how they like it.

Mr. Harris: It came from the Ozark Mountains. It is an excellent fruit and gives a longer season of bearing. I have five or six plants. I know they bore heavily this last year, and it is very productive, but the fruit is very soft.

Pres. Underwood: I think Mr. Hopkins is now ready to report the yield of his raspberries.

Mr. Hopkins: An acre yielded about 1800 quarts. We had a very severe drouth last year which cut off the crop some.

Mr. Brackett: That gentleman has been speaking about his blackcaps, and I would simply like to ask a question. What raspberries and blackberries would the members suggest staking. Staking is quite an expensive feature, and such varieties as the Marlborough want staking the same as some of the leading reds and blackcaps. Now, I would like to know what varieties of blackcaps it would pay to stake.

Mr. Harris: There are two objects in staking. The first object in staking raspberries is to get them compact, so we can work them both ways with the horse, and the second object is to keep them clean. Take the blackcap raspberry, for instance; if it sprawls out a foot on either side you cannot get a horse through, whereas, if they are staked and tied up in a compact mass, it leaves space for a horse to pass through. There are two objects in cultivating with a horse: it is more economical than to cultivate by hand, and it is much better; so we stake them to save another expense of hand cultivation. I think it is cheaper to stake and tie them than to cultivate them by hand. Three years ago they were so thick we could not get through with the horse. We staked them and the expense was considerable, but then we could cultivate them. Some varieties must be staked. Take some of the red ones, the Marlborough, for instance; if it is not staked and a rain comes along when the

berries are ripe, the berries get so full of dirt they are not fit for the market. We tried mulching and that is very satisfactory, and we tried staking and we like that plan better.

Pres. Underwood: Your answer would be, Mr. Hopkins, that it would not pay to stake any variety.

Mr. Hopkins: No, sir; I would not stake them.

Pres. Underwood: Has any one else an answer to that question?

Mr. Harris: There is another point brought out there in his cultivation. If the plants were properly taken care of, I do not believe in going through but once until the plants leave out. We have wire on each side of the rows, and used that for three years, but that is only on two varieties, but we shall use it after this on the Nemaha and Schaffer. We are going to use wire or something else. We cut back a little more on blackcaps than on red raspberries.

Pres. Underwood: Is it not better to use wire than stakes?

Mr. Harris: It is cheaper.

Mr. Brackett: That was really my question. I meant stakes with wire on.

Pres. Underwood: In my experience we have always put up our raspberries with wire, using two wires to the row, using low stakes and setting posts at the ends of the rows, simply using a light stake to hold up the wire, so it does not sag too much, interlacing the wire and bringing the raspberries up between the wires and, crossing the wire each time. There may be some better way. That is what we want to find out here, and the very thing we are all interested in is to know whether it pays to use wire. I have ten acres of raspberries coming into bearing next year that we are going to stake up with wire as an experiment any way, and, so far as our experience has gone, I should think the wire was the best thing to use if you were going to use anything at all. I cannot see that it would make any difference with us as to the variety.

Mr. Brackett: I should think you would want to stake the Marlboro. I suppose there are some varieties you would not find it necessary to stake?

Mr. West: What would be objection to trimming them after fruiting?

Mr. Hopkins: I would not think it would do any harm, although Mr. Lyon claims he killed a lot of his Philadelphia when he trimmed them in August at one time. I presume they stopped growing, and it killed them.

Pres. Underwood: When would you pinch them?

Mr. Hopkins: I pinch them any time.

Mr. Harris: I do not think the red raspberry should ever be pinched.

Mr. Wm. Turnbull: In speaking about planting raspberries so far apart I want to tell you a little experience. I am an amateur and will not go into the details, but I went to work and set out a patch with little bits of plants, and I got them pretty close together, and when they grew next year they were all close together. One night friend Harris stopped at our house, and the first thing in the morning my wife asked him to go to see the garden and the raspberry patch. When he got there, he just held up his hands. "I never saw such a crop of raspberries in all my life. And they are planted so close together. I do not see how that comes. I never saw such a crop. How is it?" I said my wife looked after everything, and that is the way it comes. I have since planted them farther apart, and we have never had such a good crop.

Mr. Harris: Mr. Turnbull is telling the pure facts about it. That is one reason why I am in favor of close planting. The variety he speaks of was the old Philadelphia, and it looked as though there was a half bushel on every hill.

Mr. Cutts: Has anyone ever seen a whitecap berry bearing to any extent? Some one brought me one last year.

Mr. Smith: It is a very hard, solid berry, and if any one buys them, they don't want to buy them again.

Mr. Harris: You can't sell them in the market the second time.

Mr. Smith: They are inferior in flavor and quality. They do not yield very early, and they are not good berries.

Mr. Harris: They are a sort of variation from the black-cap. I had some on my place, but it would not pay to grow them.

All plants do not require yearly repotting; some need it twice or half a dozen times a year, as will be the case in growing plants from seeds or cuttings to blooming size. It is easy to find out when such plants need repotting. Spread the fingers of the left hand over the surface of the soil, and turn the pot top downward, rapping the rim sharply once or twice upon the edge of a bench or table. This will leave the mold of earth and roots upon your left hand, and if the roots are crowded they need a pot one size larger. Old specimen plants which do not need repotting should be topdressed yearly with well-decayed manure or rich earth.

MY FIGHT WITH THE ANIMAL KINGDOM.

MRS. S. IRWIN, VINECROFT, EXCELSIOR, MINN.

Had I chosen the subject of my paper, I should certainly not have called the infinitesimal creatures with whom I am expected to deal chiefly by a name of three syllables, but titled the smallest by one of as many letters—bug—and the largest by one of four letters—worm—for I have vainly tried to find some person who could boldly classify and properly name the little insect that has caused so much damage to our grapes in Minnesota. All style it simply "aphis." Well what is "aphis"? I turn to my little dictionary and read "a vine fretter," or "plant louse." Well, it certainly is the first, for it fretted all the leaves off my Delawares last season. "Plant louse" I find is a wingless, sucking insect. That definition does not fit my "vine fretter," for it has wings, or something that answers the same purpose, something that enables it to pass rapidly from one row to another, and I have not yet determined how it gets all the life out of millions of leaves, leaving only the main fibers and stems to fall at their leisure.

But I believe I was to give my experience, and, being a thorough Methodist and used to doing so, I can really handle my subject better in that way. I suppose the bugs were with us a long time before we noticed them in particular. So we went on through last season, dealing out Bordeaux mixture, though we did this on the homeopathic plan, as the entire summer was so dry that the earliest doses fell off with the leaves. It was not until about three weeks before gathering time that we began to notice an unusual noise among the vines on approach and see numberless little flies flee before us. At first, we thought no especial harm could come to the vines so late in the season, but when the increase became so rapidly immense, and the leaves began to take on the somber hues of the frost king, we began to think fast and hard and talk, too, for that matter, enquiring of everybody we thought likely to know anything about it for a remedy and impressing upon every grape grower we met, the importance of making enquiry about them when among people from other sections of the country. No one except ourselves seemed to care much about the subject, and we almost concluded that we were fussing unnecessarily (you know women always do that), and we learned nothing. Our grapes hung and hung out in the blazing September sun upon branches browned and nearly bared, while the bugs played an incessant victorious march upon the dried leaves, and, at last, because the frost kindly held off, and there was really nothing else to do, they ripened and the harvesters began their work, a silent, solemn crew, learning of necessity the lesson so hard for us all to remember, viz:—that there are times and places when we would fare better if we keep our mouths shut. My grapes for some reason were not fly-specked as were many of my neighbors; I suppose because the leaves were not destroyed quite so rapidly. Just as we had finished our harvest, the long desired rain began to fall, and we buried our grapes in the mud.

Almost with the first appearance of leaves this spring came indications of bugs—very small indications, to be sure. Our glass did

not disclose eggs at all; we saw just a very small, white, furry something like a wee fairy in a blanket. In a few days the fur disappeared and an oblong package of a bluish green color lay in its place. In a very short time we discovered that it had eyes and long gauzy wings, but the wings seemed to be fastened tight to its body to the very tips, and the eyes looked idiotically at us as much as to say "Look if you like, don't you see I am tied hand and foot"? In a little while the wings were loosened and tiny feet appeared, upon which he blundered about the under side of the leaf, venturing to the very edge, but turning about again with the consciousness that he could go no farther. Our next visit found him arrayed in a very gay tennis suit of buff brown, very pretty, very becoming, but when we attempt to put our finger on him, he "isn't there." He has an engagement with all his relations to dine upon our grape vines. Now what are we going to do about it? We have in our employ a man who should be better known to the horticultural world, a man who has practical ideas. When the fly season came, he said: "Why not catch these fellows with fly paper"? So we sent for some, and the druggist sent us the poisoned kind. We placed the roll upon the top pantry shelf, where it still remains. Then he suggested that the barrel of useless coal tar in the wagon shed might be utilized. So we took a barrel hoop, stretched muslin over it, attached a handle, smeared it with coal tar and proceeded to capture the enemy. But they were not of the kind that fall so easily into every trap, and when we gently shook the vines, they vacated for the next row. So this would not do. Our next experiment was to take eight laths, make two substantial frames, full lath size, cover with strong muslin and paint with tar. Two men would take these frames—on opposite sides of the rows, placing them as nearly together at the bottom as possible—then with a little cluster of the branches of some tree with the leaves still on them gently strike the vines with a downward movement. The first results were astounding. Several times in each row, the workers were obliged to scrape off the enormous collection of insects and paint over again. This was kept up, the bugs all the while rapidly decreasing, until the harvest came on, which proved very satisfactory, as we took from my vines just four thousand baskets. I wish I might add in story fashion, that the enemy were completely routed and that next year I expected to reap even a larger reward for this season's labor. But I cannot, for the enemy still camp upon my premises, and not knowing his ability for furnishing recruits I can only await developments.

I will just add a few observations along this line before leaving it. First, that the insects do not seem so plentiful on the grape vines on bright days as on cloudy ones, and it is useless to try and catch them except on dark days or after sundown. Second, like the man who "sowed tares," they seem to be open for business through the entire night season. Third, that they prefer delicate grapes. My Pockington, Prentiss and Duchess were almost ruined, bearing only about one-fourth of a crop.

The secretary said I was not to limit myself to grapes but speak of berries and their enemies too, but my paper is too long already

I was told by a man supposed to be very learned in these things that every enemy to fruit had its parasites and that no one bug or worm was likely to be troublesome more than three years at a setting. Well, it is a comfort to know that something is sure to "get even" with them. But, meantime, I do not propose to keep on planting and then sit tamely by and watch these creatures eat up my labor, while the parasites are coming, if I can help it. So I would like to know if there is any way of heading off the raspberry borer in my Cuthberts, the kind that goes in backward with a gimlet attachment to his tail; or how to cope with the blackcap trouble, the one that causes the berries when just out of bloom to turn dry and hard as pebbles; the best remedy for currant caterpillar, and when applied; also, if anything besides kerosene emulsion has been used for plant lice on currants, apples and plums. The emulsion has proved useless in every instance in which I have tried it. Or in all these things is Bob Burdett's doctrine orthodox, "to raise weeds plentifully all through your fruit and spray them abundantly with the insecticides, thus inducing the insects to leave the fruit and fatten on their favorite diet!"

STRAWBERRY CULTURE.

R. J. COE, FORT ATKINSON, WIS.

Henry Ward Beecher once said: "Doubtless God could have made a better berry than the strawberry, but he never did." And that is the sentiment of every one who grows them himself and can have them in all their delicious freshness and beauty. That this is also the sentiment of those who live in the cities is abundantly proved by the great quantities that are grown and marketed each season. I think it safe to say that more strawberries are put on the market every year than all the other small fruits together. If this is true, it behooves us as horticulturists to put a little thought on how to grow the best crop of such varieties as will find a ready sale at the highest market price and that at the least expense. As a rule, it is the largest crop that costs the least per quart to produce. Let us consider briefly, first, the soil and its preparation. We very often hear it said, that any land that will produce good corn is all right for strawberries, which is very true, but I would prefer a soil somewhat more moist than the ideal corn land. In preparing land for strawberries, begin, if possible, the year before planting, by manuring heavily and planting to some hard crop that can be taken off early. As soon as September 1st, plow and sow to rye, using plenty of seed, say two or two and one-half bushels per acre. This protects from loss of fertility. Plow in spring as early as the land gets dry enough to plow up fine and mellow. Immediately after plowing harrow very thoroughly, five or six times at least, and thereafter every few days until planting time. This, with the spring rains, puts the ground in the best condition for planting, being both fine and firm. A little extra work done before planting will more than pay. Land so treated will stand drouth much better than in any

other way that I have been able to prepare it. Don't plant strawberries after strawberries, unless you are willing to take a partial crop where you should get a full one. The first crop seems to so take certain elements from the soil that the plants will be small and weak, and such plants cannot produce a heavy crop. In fact, you have lost nearly or quite half the crop before you fairly begin.

PLANTS AND THEIR PREPARATION.

And right here another "don't" comes in. Don't ever take plants from a bed that has borne fruit, for even though you may get young plants, they were grown from plants that had just been weakened by producing the crop of fruit and are not as strong and full of vigor as plants from a new bed would be.

Don't even take plants from between the rows of a new bed, because these plants are small and immature, and cannot possibly make as strong, vigorous fruiting beds as larger, riper plants would do. I have laid a good deal of stress upon getting only good plants to start with, because, to my mind, success depends very largely upon getting started right. It is only by having the very best plants, that the largest crops can be grown. No man ever yet succeeded in growing a heavy crop, unless he had good plants to do it with.

Have your plants dug two or three days before you want to use them. Plants dug and put in a good cool cellar, spread out in thin layers, with the roots kept moist and well covered with an old blanket or something of that sort, will throw out little white thread-like rootlets, and when properly planted will not wilt but will start to grow at once, while the plant that is dug and immediately planted will wilt and stand still for several days, unless the weather is very favorable at that time. A still better way, but a little more work, is to spread them in thin layers, with a little soil between the layers, until the rootlets show, usually about three days.

I find that most people who have strawberry plants shipped to them think they must get them in the ground just as soon as possible. I think the above treatment is even more important with such plants than with those freshly dug. I remember a few years ago we had a thousand plants of a new variety shipped to us, which arrived in very poor condition and looked as if at least one-half of them were dead. The bunches were opened and thoroughly wet. The plants were then heeled in, in thin layers and covered about four inches with marsh hay. At the end of a week they were planted in the field, and almost every plant grew and made a very nice growth.

PLANTING.

Make the rows three and one-half feet apart and be particular to get them straight. In planting, take pains to get every plant on the line, so that in cultivating you can get up close to the row and leave but little to do with the hoe. Horse work is cheaper and so far as it can be used is so much better than hand labor, that we aim to do everything possible with horse and cultivator. In planting be particular to get your plants in the ground as firm as possible.

Neglect on this point often causes very serious loss. We have tried a good many ways of planting, but have found nothing that suits us quite so well as a good dibble. In using this dibble we thrust it into the soil the full length, crowding it forward so that the top of the hole is about two inches wide. Have your plants with the roots well moistened, and as you pick up a plant spread the roots out somewhat fan-shaped, and place it in the hole with the crown just even with the surface. Now shove in your dibble about two inches from the hole, giving it such a slant that the point will be very close to the bottom of the hole, and crowd it up to the plant firmly. This gets the soil in close contact with the roots their entire length and puts the plant in the best possible condition to grow and thrive from the start.

CULTIVATION.

Cultivate and hoe immediately after planting to get the surface fine and mellow, and cultivate once a week to keep it so. If it should rain after cultivating, cultivate again as soon as the ground is in good condition to work, the object being to never let a crust form, but to have the surface always fine and loose. Keep all blossoms picked the first season. Treat all runners as weeds the first one or two hoeings, so as to let the plant get well established before making any new plants. Then, when the runners are allowed to grow, they will grow very rapidly and will make large thrifty plants. I have noticed in digging plants in the summer that the first plant from the parent plant would be much smaller and have less roots than the second or any other one on that runner. If the first runners are cut off all the plants will be strong ones. The ideal strawberry row is 18 to 20 inches wide with the plants not too thick in the row, and when you get it the width you want it, treat all runners as weeds again. We aim to make the plants grow as fast as possible the fore part of the season, and get our row as wide as we want it just as soon as we possibly can.

The strawberry plant is always making an effort in two directions to reproduce itself; first, by means of the runners, and thus making new plants; and second, by means of the fruit and seeds. By cutting off the runners, the energy of the plant which was put into the growth of new plants, will go to the development of strong fruit buds. I have seen a single Wilson plant with all runners kept off that could hardly be covered with a half-bushel measure, and a whole acre of them that averaged a quart of berries to the plant.

WINTER PROTECTION.

As soon as the ground freezes hard enough to drive on with a team and wagon, cover lightly just enough to hide the plants from sight. In the spring, as soon as plants start to grow, go over the bed frequently to see that the mulch is not on too thick. If you find the plants getting white and spindling remove a part, working it between the rows, leaving it thin enough over the row for the plants to grow up through readily.

SECOND CROP.

If it is decided to grow a crop the second year, mow the plants off close to the ground as soon as the fruit is all harvested. If your

Christmas Lake, one mile south-east of Excelsior, one of the Grape Growing centers about Lake Minnetonka
The residence of Mrs. S. Brown appears at the left, her vineyard lying between the house and the lake

strawberry bed is so situated that you can burn it off without danger to other crops or buildings, loosen up the mulch and after two or three days drying set fire to it on the windward side so that it will burn quickly. This destroys all insects and fungus growths, if there are any, and leaves the old bed in the best condition to work out and make into a new one. Perhaps, just a word of caution would not be out of place right here. If the weather should be very dry just at this time, there might be some danger of injury to the plants, but I have never seen it if the work is done as soon as the berries are harvested, but I have never seen it if the work of burning was delayed for two or three weeks. If we are having plenty of rain we cultivate the bed at once after burning and narrow the rows down to about eight or ten inches in width. If very dry, we leave them wider, say twelve to fourteen inches. Keep free from weeds the same as a new bed.

DISCUSSION.

President Underwood: This paper is now open for discussion.

Mr. A. H. Brackett: I got a larger crop this year from a bed that was burned over than I did from a new bed, considerably more.

President Underwood: I do not think you can make any mistake in burning the bed off, and I do not think you need to be afraid of the drouth. A year ago last summer we burned a strawberry bed over, following the advice of Mr. Danforth, of Red Wing, perhaps the most successful grower of fine strawberries in the state—at least, he is about the most successful competitor at our summer meetings in showing fine fruit. A year ago last summer, as I said, we burned a bed over during the dryest time. We first put on a quantity of straw, and no bed could be more thoroughly burned over than that was. There was not a particle of rain, nor was there the slightest sign of anything growing on that bed for three or four weeks after it was burned. It must have been some time in September before there was enough moisture in the air or in the ground to start the strawberries or anything else, growing. That bed came on, and without putting on a penny's worth of care whatever it was the best and most productive bed we had this year. We followed the same plan on five or six acres this year, and it was entirely successful. I feel certain that is the most economical and most successful way to treat an old bed.

Mr. J. P. West: How often can that burning be repeated?

President Underwood: I hesitate to say. I know there are some growers of fruit that make it a practice to plant a new bed every year, and I hesitate to say that there is any better

way, because men may be successful in growing strawberries for market by using some other method, and I would not pretend to say whether you had better burn over your old bed or not. Our bed now is three years old and is in fine condition for fruiting next year if frost does not take the fruit. It gave us a good crop this year. I think, also, success depends a good deal on renewing the young plants occasionally. If you can plow out the rows and get some young plants, it would be well, because, I imagine, after three or four years the old plants would not give you as good fruit. Where the rows are plowed out, you can keep the rows successful for ten years. I do not know that it is as profitable as to plant them every year. I think, probably, that men growing strawberries for the market, making that their business, would want to plant them at least every other year, if not every year, but I will say we have been exceptionally successful in keeping them two years, and next year will be the third crop.

Mr. C. Wedge: I would like to have Mr. Underwood tell us how he set out those plants. I saw a very fine stand of plants at his place.

President Underwood: I have been corrected so much this past summer for telling about that strawberry bed and speaking about it as though it was my production, that I have to be very careful, although Mrs. Underwood is not here. It was Mrs. Underwood who did the fine work, the successful work. I can speak, perhaps, more freely because it was not my own. I think she has the finest five acres of strawberries I ever saw, planted on ground that had been cropped to small grain for five years. She had the ground harrowed over and smoothed in good condition for planting, marked the rows four feet apart—and as we always use a rope for marking we get the rows absolutely straight, as straight as you can shoot a gun. Then we use a planter, the "Baldrige," a cut of which is shown in our magazine, and it is the finest thing for planting strawberries you can possibly use. (Mr. Underwood here exhibited the instrument). You can set it to any depth you want it by means of a gauge and thumbscrew. You have got to have good soil to use the planter in. In soil where you can work it, it is a fine thing, indeed. You put the planter over a plant and press it down, then withdraw it with the plant and deposit the plant in a box. A man can do that very rapidly, almost as fast as he walks; he picks out the plant and sets it down in the box, and they are taken wherever you want to plant them. They take

this to make the holes with, and a man can make the holes just as fast as that. (Illustrating.) We have shipped a good many plants taken up in that way. It is more expensive to take up plants in that manner than it is to dig them up in the ordinary way. I do not believe there was ever a better five acres of strawberries grown than Mrs. Underwood had this year. How they will turn out next year, I do not know. If we have a favorable season, she ought to have a very fine crop.

Mr. A. J. Philips: Can you give an estimate of the cost of planting an acre in that way?

President Underwood: No, I cannot. Mrs. Underwood would know to a cent.

Mr. Wedge: How far apart do you put the plants?

President Underwood: A foot apart in the row. Last spring we planted two rows of Warfield and one of Bederwood; the Bederwood ran out, and then she put in Captain Jack. Warfield and Bederwood are her best plants for growing fruit, and then Crescent and Bederwood and Captain Jack, two rows pistillate and one staminate. If you can use this implement for strawberries, it will please you.

Mr. Wedge: What is the name of it?

Secretary Latham: It is called the "Baldridge" planter. It was illustrated in one of the numbers of our Horticulturist.

Mr. Brackett: It does not work very well in clay soil.

President Underwood: No, it works best in loose, mellow soil.

Mr. Wedge: Will it work in very wet soil?

President Underwood: You do not want to have your soil wet; you do not need it wet.

Secretary Latham: One of the gardeners down here at Fort Snelling tried it and was greatly pleased with it.

President Underwood: They use machine planters now in putting in strawberries, and some of our Wisconsin friends can probably tell us how successful they are. I understand they use them at Sparta, but I am positive that there is nothing that can be used that will give as a good growth of full rows of strong plants as something of this kind.

Mr. Brackett: Don't you cut your late runners off?

President Underwood: They grew so strong and vigorous that they did not seem to want any help; they took care of themselves.

Mr. Philips: I saw this bed Mr. Underwood describes, and it is a pretty hard bed to beat. I would say in reference to

planting with the machine, at Sparta they have a machine; and they set out plants at the rate of about one acre a day. The beds will not average nearly as well as Mr. Underwood's, but they are about as good as you find them anywhere. There is scarcely any re-planting necessary. Mr. Fisher and I followed the machine twice up and down the row, and we did not find a single plant missing, and I know it would almost average the same throughout the whole field. It waters the plants at the same time. Every plant is watered as it is planted, and there is a roller that rolls them down, and they are set very firmly. The ground was prepared as Mr. Coe describes it. I think they went over it four times with the pulverizer—I call it the “digger.” I think they went over it four times before planting, and then one team draws the water; it takes about seven barrels to the acre. One man drives the machine, two boys do the dropping and two girls get the plants ready. It did the work last year very finely.

Mr. D. Cook: There is one point about the distance apart plants should be set I want to speak about. It strikes me we get a better stand if planted close together. It is generally recommended to plant strawberries two feet apart in the row. My experience has been, during those dry years, that it was better to set them close together. I set my plants eight inches to a foot apart and I got a good stand of plants. I would like to have that thing decided.

Mr. Brackett: My plan is to set them two feet apart in the row, and I have got as nice a bed as can be seen anywhere, but I have cut the runners off three times; the Bubach and such varieties as make a slow growth, the most of them I have cut off three times. I cultivate them both ways with the horse.

Mr. Coe: Our practice has been in regard to setting a certain distance apart, to regulate that according to variety. We plant twice as many Wilsons as we do Warfield on the same area.

Mr. Brackett: I accomplish that same end by having the rows close together.

Mr. West: I have had on hand a disease of the strawberries. I have some strawberries that were affected with rust. I had about one thousand plants that looked very finely, but after the first frost came, when I was at home, it looked as though the frost had killed them. I was informed by every man who saw them that it was rust. It was caused by freezing and thawing afterwards. The land was cleared two years ago last spring;

it was very heavy, rich soil. I would like to hear something about it from some of those old strawberry growers who have raised them for so many years.

Mr. Kellogg, (Wisconsin): In Wisconsin we have some trouble with rust; some varieties are worse than others. The Bederwood is one of the good kinds that the rust does not affect, but there is hardly any variety that is exempt entirely. I have never tried the Bordeaux mixture. I believe it would be an effective remedy if put on early enough. The frost injured the foliage in May, until it almost ruined the whole plantation. I believe the best way to avoid rust is to plant those varieties that are least liable to rust and keep working off those varieties that are not free from rust. The Van Deman has failed me now for three years. It has failed on account of the frost. We had two crops, but after that it was an entire failure and gave us no return in fruit, and if you have a late frost you are going to lose it in spite of everything.

Mr. West: I have the Parker Earle, but there is no difference in the appearance of them.

Mr. Philips: Did the Bubach rust?

Mr. West: It was just as bad as any.

Mr. Harris: I believe it was nothing but the frost.

Mr. Smith: I guess that is what it is; nothing but just the frost.

Mr. West: I sent some to Mr. Kellogg, in Michigan, and he said it was frost. He said there was no difference in appearance, they all looked as though the frost killed them. They looked just as they did when we uncovered them. They were as nice plants as I ever saw before the frost came. I was surprised to see the rust this fall.

Mr. G. J. Kellogg: Since I have been called out, I would like to say a word about the best method of cultivating strawberries. I believe Breed's Weeder with a man to follow with a hoe, will do the work of ten men. It will once in a while pull out a plant, but it will harrow in the row as carefully as you can do it with a garden rake and do it just as well.

Mr. Cutts: Do you remove any teeth?

Mr. Kellogg: No, I let it shake right along.

Mr. Wedge: It does nicely on sandy soil. We had a Breed's Weeder on our place for a good many years, but I do not believe it is of much account on heavy soil. Ours is a heavy soil. One rain will compact the soil so the Weeder will hardly tickle it.

President Underwood: Has any one a remedy to suggest to Mr. West for strawberry rust?

Mr. West: All the strawberries in my section are the same way. Mr. Danforth told me his looked just the same way mine did. Mr. Kellogg told me I might get a crop of berries, but he advised me to put on the Bordeaux mixture in the spring.

Mr. Brackett: If I talk too much some one pull me down. In regard to the frost, I was reading an article sometime ago in reference to a method used in France for preventing frost. The night you expect frost, take a kettle of coal tar and have a pan hung just below the kettle of tar, and puncture the pan with small holes: then start a drop or two and set fire to it, and that burning in the pan will dissolve the tar and that will make a continual fire and spread a cloud of smoke over the plantation which will keep off the frost. The article I read spoke as though they used it a good deal in France when they expected frost. If there is anything in it, I think it would be worth trying.

Mr. C. L. Smith: I read that article too. I put my kettle of tar out and set it on fire, and it made a column of thick black smoke, and as near as I can guess it was about two hundred feet high, just a straight black column of smoke, and I didn't get a cloud, and the frost did kill them. (Laughter).

Mr. S. D. Richardson: I had an experience in northern Illinois about four years ago. We expected a frost, and as there were plenty of old roots and stumps about we were up at three o'clock building fires. We had lots of fires through the orchard and a big smoke. There was a limb hanging out overhead and it was frozen solid, and I made up my mind when there is a heavy frost smoke will not help matters worth a hill of beans. When it gets down to freezing in Minnesota, you may as well give it up.

Mr. Smith: This year I had a lot of old stumps and grubs, and I nearly surrounded the orchard in order to get my smoke over it, and I piled on old slough grass that had been used for mulching. There was no wind and the smoke would go right straight up, and the frost came anyway and killed the strawberries.

MINNESOTA STATE FORESTRY ASSOCIATION.

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ANNUAL MEETING,

MINNESOTA STATE FORESTRY ASSOCIATION, JAN. 14, 15, 1896.

A. W. LATHAM.

It was my privilege to attend this meeting on Wednesday, when the literary program was given, an unusual thing for me, as usually this society has met at the same time as the Horticultural Society, which prevented it; and it may not be my fortune to meet with them next year either, as I understand it to be their intention to arrange to meet then at the same time as the sister society, as heretofore.

Secretary Barrett deserves much credit for the practical character of the interesting program prepared, which was carried out almost in its entirety. (It is to be found in the January HORTICULTURIST.)

I will speak only of the papers that I heard read myself. Gen. C. C. Andrews read in an interesting way in regard to "The Prevention and Suppression of Forest Fires," showing somewhat in detail the methods that are being pursued in this important work. Mr. H. B. Ayers read a paper in regard to "The Uses of Stump Lands," the

most important point in which, it seemed to me, had reference to the facility with which a further growth of pine may be maintained on such lands where they have been protected from fires. When burnt over, it is found very difficult and expensive growing pine there again. Mr. O. F. Brand gave a rough estimate of the probable value resulting from the preservation of our forests, giving some interesting figures showing the results in millions of dollars for a term of years. It was a suggestive paper. Mr. L. R. Moyer read a paper reciting his observations in regard to the proper trees to plant on prairies. Like all of his productions, it was practical and thoughtful. Col. W. A. Jones spoke of the relation of the forests to our reservoirs. I did not hear much of this paper, but judge it to have been of value on account of the applause awarded it. Dr. Chas. H. Hewett, secretary of the State Board of Health, talked a short time in his usual lively and exhilarating way of the relation of forestry to the public health. As he presented no paper, and there was no stenographer present, his remarks will not appear for publication, as will probably all the papers. Some of these papers will find an appropriate place in *THE HORTICULTURIST*.

Edward A. Beals, of the Weather Bureau, read a paper on "The Influence of Forests upon the Weather," full of valuable details and figures. The amount of work he must have bestowed on this warrants more publicity than it could receive from such a limited audience. Prof. W. M. Hays talked in his familiar way of "The Relation of Forestry to Agriculture," and made numerous applications. Mr. D. R. McGinnis, of St. Paul, while not on the program, made an inspiring speech at the close of the session.

Perhaps the most interesting feature of the meeting was a suggestion made by Capt. Judson N. Cross in regard to the state's accepting the trusteeship of any forest lands that are tendered to it by the owners, with the understanding that after reimbursing itself for the expense attending their care and development the proceeds should go to the support of educational institutions, allowing, however, for the payment of one-third of the net proceeds, for a limited time, to the owners of the land or their heirs. Ex-Governor John A. Pillsbury, who was present, intimated that there were a number who would like to avail themselves of such an opportunity to dispose of their pine lands. A committee was appointed to prepare a bill to present to the next legislature, embodying these ideas, the result of their deliberations to be made known to the public as soon as possible. This committee has not yet been announced. This plan seems to present some very important features, not the least of which is that it would commit the state to the adoption of a thorough system of forestry, which would be necessary to carry out the trust assumed, and incidentally would affect the management and care of all the forests in the state.

The result of the annual election is noted above. The attendance at this meeting was very small, altogether too small for such a program. It is to be regretted that more of those who are especially interested in this subject could not have been there. Half or more of those in attendance were members of the state horticultural society.

NOTES FROM THE FARMERS INSTITUTE.

CLARENCE WEDGE, HORTICULTURAL LECTURER.

While at Echo, in Yellow Medicine Co., through the kindness of Mr. C. H. Phillips, we had the pleasure of visiting one of the finest orchards of its size we have seen in the state. It is on the farm of Mr. Julius Frank, (P. O., Wood Lake) eight miles from Echo, and comprises about forty trees of our best old varieties, that have been planted seventeen years and have been very profitable. Two hundred dollars worth of fruit was sold from these trees in 1892, and they have borne one good crop since. The larger share of the trees are in perfect condition; those that are diseased have mainly become so through lack of protection from sunscald. We made the following notes: Twelve Duchess, some measuring 24 in. in girth, most of them looking very fine; one tree has borne eleven bushels in a single year; one Minnesota, trimmed 4 ft. high and leaning to the north in perfect condition, 24 in. in girth, very fruitful; one Transcendent, 32 in. in girth, perfect condition; one Whitney, 18 in. sunscalded; one Beecher's Sweet, 20 in., perfect tree, good bearer; one Early Strawberry, 25 in., good condition; another fine old Beecher's Sweet, 32 in., perfect condition, spread of branches 21 feet. Take it all through the orchard, there are few vacancies, and a grand good even lot of trees. When we consider that this orchard is located on the open prairie, 142 miles west of St. Paul, on a south slope, what a *wonderful encouragement* it is to all in the south half of the state who desire a good home orchard! Mr. Frank has a fine grove on the north and west of the orchard, planted no doubt at about the same time, and many things about his place indicate that he possesses good horticultural sense. We were delighted to look over his grove of an acre or more of thrifty white ash. The trees are planted about four feet each way and are nearly keeping up with the softer woods that are mixed with them. This fine ash grove will no doubt be a permanent monument to the good sense of the planter.

While at Madison, Lac Qui Parle Co., within a few miles of the Dakota line, we were much pleased to find so many good thrifty shade trees planted about the village lots, among them healthy, bright looking trees of the Scotch pine, that pioneer of the evergreen tribe. Much of this pleasant state of things was said to be due to the fact that Mr. C. H. Siljan has established a good home nursery near the city. We heard only good words for this pioneer nurseryman, and were very sorry that we were not able to make his acquaintance or inspect his premises.

While at Madison we also saw some thrifty young apple trees, and were told that a Mr. M. C. Chamberlain, of Lac Qui Parle, had succeeded in raising several bushels of standard apples. In a grove on the Munson place near Clarkfield, we were pleased to find a mixture of ash and elm among the box elder and soft maple, that comprise the most of the grove, contrary to the usual idea that ash is too slow a tree for the hurrying West. We found both ash and elm well up with the other trees.

While at Morton, on the Minnesota river, we were interested in rambling over the granite cliffs near the quarries. We noticed the

wild red cherry and Juneberry growing quite common among the irregular fissures in the immense rocks. We were somewhat surprised to find on the very top of one of the highest and dryest of them a dwarf but healthy basswood. The rift in the rock from which it sprung could not have been more than six inches wide, and exposed as it was to the dry winds from all directions it did not seem possible for it to get moisture enough to last it from one rain to another. We think it not unlikely that the basswood would stand with the ash and elm as a drouth resister.

We have noted the need of some shrub or bush that would spread rapidly for the purpose of making a forest floor for our prairie groves, something to grow between the trees after cultivation ceases, that will hold the leaves and snow, shade the soil and make natural forest conditions. We have been able to think of nothing better than the red varieties of raspberries, that propagate so rapidly by suckers. Can not some thoughtful member of our society suggest varieties and methods for carrying out this important branch of forestry?

Near Gaylord we found an orchard that has been planted twelve years. The Duchess were in almost perfect condition, measuring twenty inches in girth; Tetofsky excellent, sixteen in., not very fruitful; Transcendent, thirty-one in., good condition; Wealthy, twenty-two in., perfect, bearing one bushel per year. We learned from our landlord of several successful fruit gardens at some distance.

THE WISCONSIN TRIAL ORCHARD.

EXTRACT FROM REPORT BY SECRETARY PHILIPS.

The state of Wisconsin having made an appropriation of \$500 "for the purpose of locating and starting a trial orchard," Secretary A. J. Philips and others have selected a location near Wausau, "on the farm of Mr. Edwin Single, who takes charge of the orchard subject to the direction of the officers of the state society. The lease runs twenty years or as long as the land is used for trial orchard purposes, rent to be \$5 per acre each year as fast as the land is used, the amount of land to be ten acres if desired by the society. All revenue from crops raised on land are to be paid to the state society treasurer, after expenses are paid. The land is to be kept fenced by Mr. Single, and no stock allowed to run in the orchard. There are bearing trees of Duchess, Wealthy, Haas and No. 20 near Wausau and young trees in the vicinity are looking very well. The land is high and heavy clay and was once heavily timbered. It lies nice, sloping a little to the north. My idea is to set a few trees of each of our hardiest varieties each year for five to ten years, also to set some trees each year of a good variety for topworking, and work as soon as possible, also to plant some grafts each year of the same varieties, so that three distinct experiments will be going on at the same time on the same ground; and the trees should be staked and protected when planted. Nurserymen of this and other Northern states are asked to contribute a few trees of anything new they desire to have tested, and notify the secretary of the Wisconsin society on or before April 1, 1896, when shipping directions will be sent." The secretary's address is West Salem, Wis.

A. W. L.

SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.**SECRETARY'S REPORT, CLARENCE WEDGE.**

The third annual meeting of this society was convened in the court-house of the city of Austin, Dec. 20, 1895. On account of the absence of the members who were on the program, the forenoon session was of an informal nature. The afternoon business was opened by an interesting paper on "Growing Strawberries from a Farmer's Standpoint," by J. Christgau, of Sutton. He had picked 325 boxes of strawberries from twenty-eight square rods, an old bed. Thinks that if some farmer in each neighborhood would raise plants for sale and keep them pure, it would help greatly in the matter of bringing about general success in the matter of growing a supply of home fruit; uses a harrow cultivator, as it can be run close to the plants and kills weeds when they are small. With a little forethought and care the farmer will find it profitable to raise his own small fruit, and certainly should not deprive his family of a luxury that is so easily within reach.

Geo. H. Prescott, of Albert Lea, gave his experience in irrigating strawberries. He had obtained good results from carrying water in pails from a shallow well and pouring it on the strawberry bed, and from this beginning in irrigation has erected a reservoir elevated above the level of the beds to be watered, which he fills by hand pump and distributes by hose. With this crude system of irrigation he has been able to raise as many as 4,420 boxes of strawberries from a measured acre, in a very unfavorable season, thus having so much of a monopoly of the market that he was able to dispose of his berries at a fancy price.

Mr. Patten, of Charles City, suggested as a protection from late spring frosts, planting hills of buckwheat about the 20th of July along the rows of plants. These hills of buckwheat will make a strong growth and a light fluffy cover for the plants in late spring time.

The practice of burning off strawberry beds the second season was discussed and generally favored, although some beds were reported injured when covered with too thick a mulch when burned and allowed to burn too slowly.

Edson Gaylord, of Nora Springs, Ia., compared the opposite methods of Eastern and Western orchardists, recommended cool northern exposures and free circulation of air, advised all to avoid strangers in buying nursery stock. Topworking our more tender varieties on the Virginia crab or Hibernial apple will increase their hardiness and go far towards settling the apple question for the North. Mr. Hawkins, of Austin, has had little success in growing apples and thinks that much hinges on getting the proper root; has had excellent success by deep planting, by which process the trees are inclined to throw out hardy roots; has found the Hibernial the best tree he has planted. Mr. Patten thinks highly of the Shield's crab as a stock for topworking; is of opinion that congeniality is one of the most important points to be considered in topworking. Considerable time was taken up on this subject.

Mr. Gardner, of Osage, Ia., in his paper on hardy fruits, accounted for the great variation in the experience of horticulturists by the difference in their soils, situations and environments; believes in thorough preparation for planting by deep plowing and subsoiling, using the varieties recommended by the state horticultural society, the reports of which deserve careful reading and study. There is no danger that any live member of the society will be "taken in" by the false representations of the "budded tree" and "model orchard" men.

N. J. Johnson, of Austin, on "How to Grow Celery," stated that growing celery on high ground costs more than it comes to. Manure is an important matter, and used in connection with bottom land and a good system of irrigation has proved a success with him; keeps the ground thoroughly soaked; prefers a very sandy soil to the usual black muck of the swamp—even clear sand with plenty of manure makes an excellent soil; finds difficulty in getting pure seed.

Rev. C. D. Belden, in an interesting address on "My Father's New England Orchard" said that if an equal amount of care and vigilance was exercised in the orchards of the West as in the vast orchards of the East, we should come far nearer the perfect success we so much desire. He gave quite a minute account of the careful attention and cultivation which his father pursued in his management of his orchard of ten acres, whereby he was enabled to support and educate a large family wholly from the income derived from this source. Success in orcharding is no accident, but like success with other crops, the result of persistent, timely attention.

Mr. H. L. Crane, of the Lake Minnetonka vineyard district, explained his method of training the vine and recommended the Delaware, Moore's Early and Concord. The Agawam is the best of the Roger's Hybrids.

C. F. Gardner, of Osage, and Edson Gaylord, of Nora Springs, Ia., were here introduced as delegates from the Northeastern Iowa Horticultural Society.

A paper on "Keeping Apples," read by Clarence Wedge, of Albert Lea, advocated cold storage as a perfect method of keeping fall apples till midwinter, the cost being from ten to fifteen cents per barrel per month. The early winter varieties should not be placed in the cellar directly from the orchard, but are far more likely to keep well in a cool, clean outhouse until there is danger of freezing weather, when they may be removed to a cool, *moist* cellar.

J. S. Harris in his list of best plums for Minnesota included Desota, Cheney, Rollingstone, Hawkeye, Wolf, Weaver, Forest Garden and Ocheeda. "Orcharding for the Amateur," by J. B. Mitchell, of Cresco, Ia., was especially valuable for the farmers. Varieties of apples from the South are, like Southern varieties of corn, adapted only to the South. Duchess and Hiberna are the two conspicuously valuable varieties for the North. A list which stands next in favor with him is: Bergamot, Lubsk Queen, Yellow Sweet and Watermelon.

C. G. Patten in "The Nurseryman's Influence in Horticulture" touched on the ethics of horticulture and gave valuable advice in

the matter of care in the selection of men to sell the products of the nursery and honesty in the description and sale of novelties.

E. H. S. Dartt, of Owatonna, read a paper on "Girdling to Produce Early Bearing." He has used the saw, the knife and wire for the purpose of checking growth and inducing the formation of fruit buds; prefers the saw. Whole and piece-root grafting was discussed and the general verdict was expressed that piece-root grafting was far preferable for propagating the apple for Northern planting.

Mr. Jensen, of Rose Creek, had had better success in growing the red than the black raspberry. He laid great stress upon the economy of planting small fruits in long rows so that they can be easily cultivated. Mr. Dartt advised against attempting too many varieties of fruits at the beginning—better undertake less and give each proper attention. The meeting was concluded by a paper from C. G. Dinsmore, of Austin, giving valuable suggestions for growing small fruits and vegetables.

The officers chosen for the ensuing year were:

J. C. Hawkins, Austin, President; Jonathan Freeman, Austin, Vice-President; C. L. Hill, Albert Lea, Secretary; A. J. French, Austin, Executive Committee and Geo. H. Prescott, Albert Lea, Executive Committee.

The membership fee was raised to \$1.00 in order that the members might have the opportunity offered by the state society of receiving the magazine and premiums of that society.

(Some of the papers referred to will be published later.—Secretary.)

LATE HINTS ON SMALL FRUITS.

C. L. SMITH, MINNEAPOLIS.

Mr. President, Ladies and Gentlemen:

I will not attempt to cover in detail all the points that might be brought out in this subject, because all of the old members of the society have long recognized the fact that we find every year something we did not know. We think, perhaps, we have mastered a subject, and the very next season we are confronted by something that we have never met with before, something that is entirely new to us. I have visited Mr. Hopkins' place four or five times, and I have asked him every question I could think of, and yet the most important thing, to my mind, he brought out today was the fact that in covering his black raspberries he lays the canes down the way they bend. I don't know whether you caught it or not. You may think it a small thing, but I have been covering raspberries longer in Minnesota than any one here. I think I was the first one to advocate that plan, but yet I have never caught on to the way of putting them down the way they naturally lean. Last year I was off chasing politics and let the other fellow do the work, and he broke off half the canes, but he was covering the canes just the way I told him to cover them, bending them all one way. Now, that is a great mistake—and this is one of the latest things I have learned. I have four different varieties of raspberries, and every bush is covered now, and I either did it myself or saw it done, and I do not think I

broke a single cane this year, the first time I ever did it with so much success, and all because we put the canes down the way they naturally lean. It cost me this year \$7.50 per acre to cover my raspberries that way. The red raspberries I found we could lay down one way, but I became satisfied it was impracticable with black raspberries, and much better to lay them the way they would naturally go, some this way and some the other way, and a single hill would sometimes lean two, three or four different ways. This was the only way I could put down my Schaffer's Colossal, by putting each particular cane in its own direction. I have got them all down and have got them covered. I do not know of any work in the garden that pays so well for the amount of labor we put in as that work of covering raspberries. I have tried the plan of leaving one hill stand up straight and laying another hill down and covering it, and I believe if a man can get back a profit of twenty-five per cent. on the money invested in a raspberry plantation without covering, it is not exaggeration to say he can get back one hundred per cent. by covering. It pays; it is the most profitable work you put on your raspberry patch, putting them down for the winter.

While I am on this subject of covering, I want to say there is another thing I learned last year. I watched Mr. Coe very carefully in what he said, and he prescribed exactly the customary routine, just what we read in the horticultural reports and papers, and just what has been said year after year, and that is, after the ground freezes hard enough so it will hold up a wagon, then mulch your strawberries. My strawberries were injured last year after it began to freeze and before it was frozen hard enough, before it was safe to put on the mulch for the winter; they were injured more at that time than at any time during the season. That was a year ago this fall. I thought I learned something again. We had a few beans at the end of the strawberry patch; we threshed them out with poles and winnowed them with the wind, and the wind blew the chaff over the strawberries, and those were the best strawberries we had on the place this year. Then later I went into the woods with a big wagon box and raked up leaves and filled the wagon box, and then scattered them thinly over the strawberries, not enough to cover the plants out of sight, but just enough so there were a few leaves scattered all along the row; and, finally, about two weeks ago when I got ready to put hay over them, I had my strawberry plants in the finest condition I ever saw them at that time of the year. The plants were all sound and good. Doubtless many of you have not taken the trouble to examine your strawberry plants when you got ready to mulch them. It freezes enough to seriously injure your plants before the ground will hold up a wagon. There were very few plants that were not injured by freezing. I have found, in taking up strawberry plants at that season of the year, that there were a great many injured in the roots by that alternate freezing and thawing. We can prevent that by putting on a light mulching of cut straw, but I find it easier to get leaves. There were seven rows in my strawberry patch 120 feet long, and it took two men and a team four hours to gather leaves enough to cover that in good shape, so that I regard the expense of putting on this thin covering of leaves as about \$6.00

per acre, as we ordinarily have to pay for labor, and I think that will pay. My strawberries went into winter quarters in the finest condition I ever saw.

President Underwood: Is there any objection to covering before freezing?

Mr. Smith: Yes, sir; I think there is a serious objection. I put four inches of slough hay over five or six feet of a strawberry row where there were strong healthy plants the 7th of October, the same time I put those leaves on, and in two weeks after I took a friend out and showed him the effects of it. The plants or leaves were all musty and rotten under the four inches of hay, but where we had put on the thin sprinkling of leaves they looked very fine—they were growing all the time—but where we had put on the four inches of hay they were spoiled.

President Underwood: Why did you not wait until later?

Mr. Smith: On that same day the plants that did not have leaves on were not looking so well as those which were covered with leaves. There was only a difference of a few feet between them.

President Underwood: Why can't you commence the latter part of October to mulch your strawberries, before severe weather comes on?

Mr. Smith: As warm a November as we had this year, it would not do to put on straw or anything that lies close.

Mr. Brackett: Is not four inches too much covering?

Mr. Smith: I want about four inches of mulching around there next spring. It takes about four tons to cover an acre.

Mr. A. J. Coe: You say it took two men four hours to cover that bed of strawberries, and at the same rate it would cost about \$6.00 per acre. That was eight hours work for one man, and four hours for the team. They would have to work very cheap, a great deal cheaper than we could get the work done in Wisconsin.

Mr. Smith: I give it to you simply for what it is worth. I think about that just as I did when I first began talking about covering raspberries. I think it would pay any one to lightly mulch the plants in October, and then later put on an extra mulch for the winter. That was my experience. I think I have learned that lesson. I have practiced it this year, and I am going to practice it next year. I have no strawberries injured by frost. I think it was about four years ago, in our horticultural meeting, some of the members had solved the question of strawberry growing at a very large profit by growing them in reclaimed sloughs. They plowed it up, ditched it, but what would make a nice celery bed would not make a good strawberry bed. I have tried it, and I have not had any strawberries on reclaimed sloughs. I have not found a way of preventing the frost from killing them. If you can get your berry patch on a side hill, do it every time. That is where we get the least frost. Not

down in a reclaimed slough, but along the slopes of a hill there is the least liability of frost.

Can we prevent frost from killing the berries? I am reading and experimenting a great deal. I tried the kettle of tar, and I tried the log heaps, and I tried wet hay. I can make smoke enough, but during the last three years at the time we had the frosts, there was no wind; the condition of the atmosphere was such that the smoke did not count. The smoke went right straight up in the air. So far as making a cloud of smoke is concerned, that is all right, but it would not make a cloud, so I had to give up the idea of saving my strawberries with smoke.

There is another way, which might be too costly, but I am going to try it just the same. I want to look over the weather reports, and when they say there is going to be frost at night I am going to cover before sundown all of my strawberries with slough hay. I have experimented a good deal, and all of my experiments have been a failure, except that when I covered them with the slough hay, just the same as I mulch them for winter exactly, the frost did not kill them. I may have to do it two or even three times, and supposing it does cost six to eight dollars each time, how many berries per acre would the frost have to kill in order to take out enough to pay for covering three or four times? The hay is on hand there now. We keep it there ready, so that if there is danger of frost we can begin after four o'clock in the afternoon and cover those berries all over before midnight. I cover them at night, and the next morning I uncover them. I believe it will pay.

Mr. Haggard: What slope would you prefer?

Mr. Smith: I would take the north slope of the hill every time. I prefer the north or northeast slope of the hill for any kind of fruit.

Mr. Brackett: How would it do for grapes?

Mr. Smith: I am not much of a grape man; I cannot answer that; perhaps Mr. Latham can.

Secretary Latham: I will not take up the time to go into this subject, but my best vineyard, the one from which I usually take the premiums at the state fair, is on a northeast slope.

Mr. Smith: I never did much with grapes, but I will know more about grapes after a while. In the matter of anthracnose, I have had very little experience with that, but this is what I did do: Whenever I found any canes affected, not knowing what else to do, I simply dug up those hills and burned the vines. In one plat of Cuthberts, I had a strip about twenty feet in width and about forty-five feet long running through cornerwise, that was affected, and almost every cane was simply paralyzed with it. They set some berries, but they did not get large, and dried up. I simply went in and broke up that whole piece, piled them up and burned them right there, and then I took good healthy canes from the plantation and set them right there, and they are just as healthy as any I have on the place. In my Schaffer's Colossal I simply dug up the affected canes and burned them, and I have not seen any bad effect.

In the matter of tying them up, I think the plan Mr. Underwood referred to of using wires is the best and cheapest and the most satisfactory. Some varieties do better without tying up than others. I have not been able to grow Schaffer's Colossal without tying. I go quite often on the market without saying anything to anybody, and I think my friend Hopkins can justly claim to get the best prices for berries of anybody who comes to the Minneapolis market, and for that reason I take a great deal of stock in his judgement as to the varieties to plant.

There is one other item I want to refer to briefly, and if there is time during the course of this meeting I want to talk about it a little further. Some of us grow berries for market, but the thousands and thousands of people of Minnesota who are interested in the work of this society do not grow fruit for market. I honestly believe there is a better way of growing strawberries for the family than is recommended by the market gardeners. I have made experiments in that line, and sometime during the course of this meeting I want to talk about that.

NOMENCLATURE AND CATALOGUE.

J. S. HARRIS, LA CRESCENT.

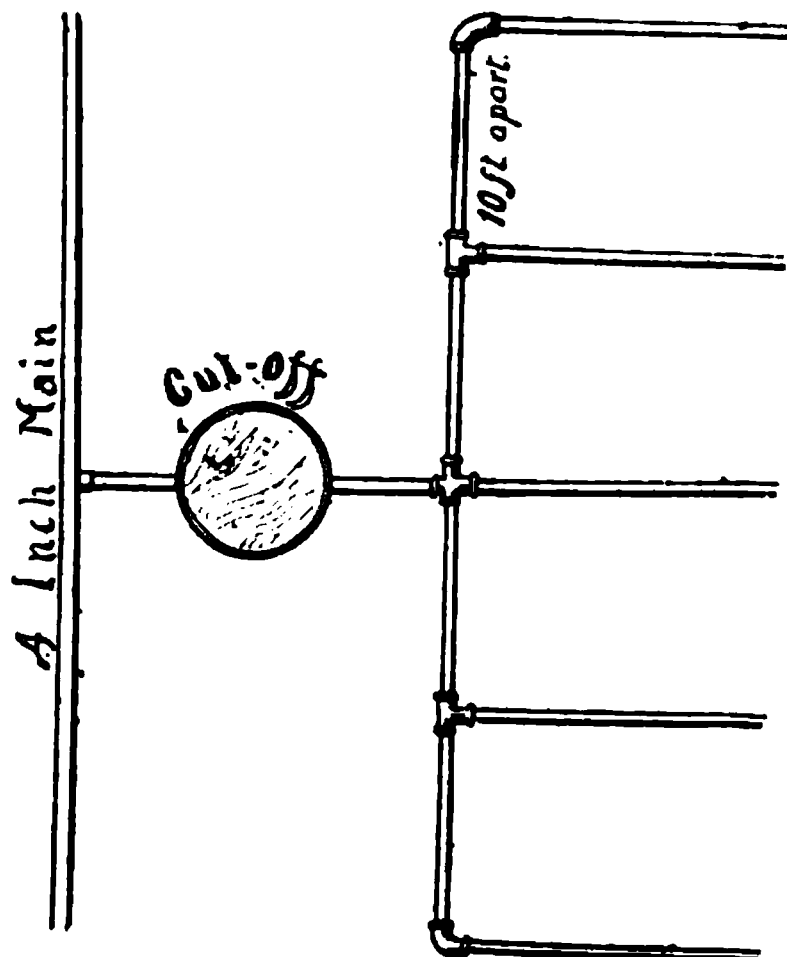
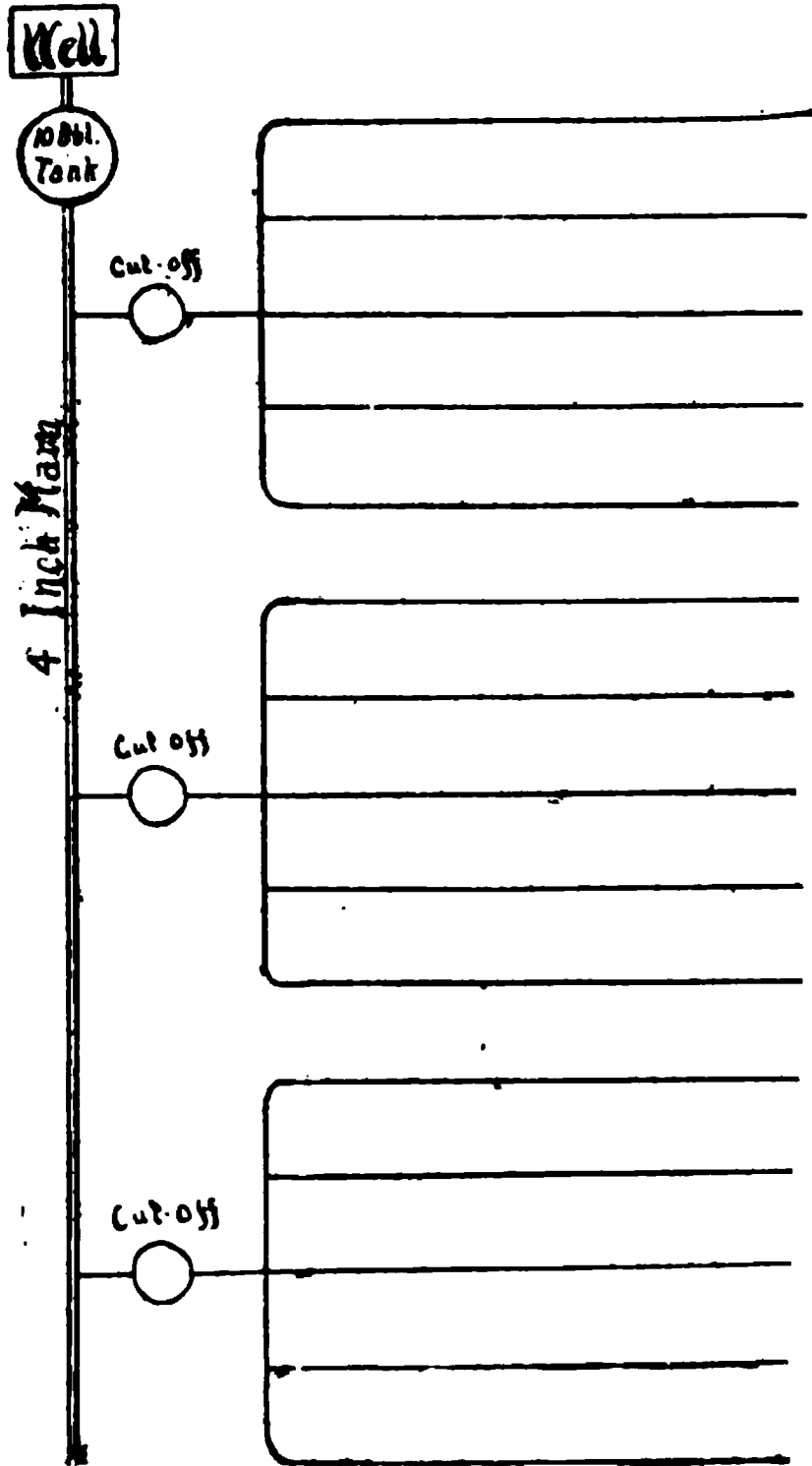
Fruits received for name since the late annual meeting: From M. Coffin, Bear Valley, Minn., one specimen, medium size, smooth, roundish, greenish-yellow with light blush cheek, flesh fine-grained, yellowish, subacid flavor, good. We pronounce it from the single specimen, with the stalk gone, to be one of the Rollins' seedlings and, probably, the Rollins' Pippin. The tree of this variety is nearly as hardy as the Wealthy, but too slow and shy a fruiter to be profitable for planting.

Form E. M. Lewis, Kenyon, Minn., four samples, all past their best season, except No. 2. No. 1 is a large fruit—not able to identify it. No. 2 is the Malinda, an excellent long-keeping apple, growing in favor. It has been described in previous reports, but for the benefit of new members we give it again. Size full medium; form ovate conical, slightly angular or five-sided; color when fully ripe, lemon-yellow, often with a pale blush cheek; stem medium, in a narrow deep cavity; calyx closed, in a medium deep narrow-ridged basin; flesh fine, firm, yellow; flavor subacid, sweet; season Jan. to May. The tree as a root graft is slow in coming into bearing and should always be topworked upon some hardy stock like Hibernial or Virginia Crab. No. 3 is the Wealthy, and No. 4 appears to be the Famense, and I should judge it was raised on a sucker or sprout of a tree that was killed to the ground in 1894-5.

Mr. H. Knudson, of Springfield, has named his hybrid sand cherry the "Compass" cherry, by which name it is hereafter to be known as the name has been accepted by the committee on nomenclature.

A SIMPLE SUB-IRRIGATING PLANT.

I have been experimenting in sub-irrigation during the past season, and have constructed a simple plant which I find a success. I use common 3-inch drain tiling, laying them ten feet apart and



12 inches under ground. A 12-foot Gem windmill draws the water from a well 43 feet deep. Herewith is a simple diagram of a section of the plant. There are five rows of tiling in a section and five sections in the plant. I can irrigate any section by pulling the plug at the place where the main pipe crosses the branch. I have not lacked for moisture at any time during the past season and have saved many times the cost of my plant. I have had many inquiries from gardeners who seem to be well pleased with the plan on account of its simplicity.—*The Market Garden.*

GROWING HUBBARD SQUASHES.

C. L. HILL, ALBERT LEA, MINN.

The Hubbard squash takes kindly to our Minnesota soil, and under favorable conditions a large crop may be grown with no great outlay of labor. When the soil is light, a good coat of manure plowed under is of great benefit.

The planting should not be done until the soil is well warmed up; the squash is a tender plant, and never fully recovers from the effects of any serious backset.

Several years ago I discarded the old system of planting in hills and never expect to resume it. Planting in drills is in every way more satisfactory,

I have an adjustable corn-marker with three runners. I set this so it will mark rows four feet apart and mark off my field for squashes in long, straight rows. The marker goes about the right depth for the seed. When the ground is all marked off, a boy drops seed along the furrows, about a foot apart or less. The seed are then covered with a garden rake. This tool does good work, and with it the job may be done quickly.

We plant only in every other furrow—that is, we plant one and skip one—so the squash rows stand eight feet apart. I would rather have them farther apart than less. At least twice as many seed are planted as we wish to have of plants. After the bug period has passed, the plants are thinned out so as to be about two feet apart.

Cultivation is done almost wholly with horses. The soil needs frequent stirring while the plants are small. The greater part of this cultivation may be done best with a section of the harrow. If a handle is fastened to the harrow, it may be guided so as to go close to the row of plants. My harrow section is five feet wide, and I go twice for every row. This knocks out the small weeds and keeps the surface soil in fine condition.

As soon as the vines get a good start, on the run, so as to be in the way, the cultivation may cease. The rapid growth of vines soon covers the ground and prevents the further starting of weeds.

The Hubbard squash is the standard winter variety. It is of good quality and a good keeper. Even the green ones, if not too green, will ripen after they are harvested and become good for table use.—*N. W. Weather and Crops.*

BLACKBERRIES AT LAKE MINNETONKA.

THOMAS REDPATH, LONG LAKE.

I wish some one better qualified had been chosen to write this paper, but I will try and tell you how we grow "Blackberries at Minnetonka." We plow the ground deep in the fall. I think subsoiling would pay. After the ground is plowed, we mark out the rows eight feet apart; then we plow out two furrows where the rows are to be planted; in the furrows we put from four to six inches of well rotted manure and turn the two furrows back. When the ground is in good condition in the spring, we set out the plants three feet apart. The first year a row of vegetables is grown between each row. We cultivate every week from the time they are planted until Aug. 15, when all cultivation must cease in order to let the wood ripen before cold weather. About Oct. 20, we lay them down and cover them with earth, as all blackberries must have winter protection in Minnesota. We uncover in the spring as soon as freezing weather is over and cultivate the same as the first year. They need no cutting back in the spring; let them bear all they will.

As soon as picking is over, cut out the old wood close to the ground. The second fall the canes will have made a growth of seven or eight feet. Then we lay them down the same as the first fall, but instead of covering them all with earth, we only put enough on the ends to hold them down; then we cover them with marsh hay, straw or coarse manure, and when they are uncovered in the spring we put this mulching around the plants; it holds moisture, and blackberries like something decaying about them. This spring they must be wired. This is done by driving posts on each side of the row twenty feet apart; one wire on each side, three feet high, is enough. This year we may expect nearly a full crop—what we call a full crop is from \$300 to \$400 per acre. The varieties that do best here are Snyder, Stone's Hardy and Ancient Briton. The first two are the most reliable.

GETTING APPLES TO MARKET.

SIDNEY CORP, HAMMOND, MINN.

"I could have sent a few apples to the winter meeting, but knowing that most of the apples for exhibiting there had been in cold storage, and as mine had no advantage of this kind, or any extra care, I concluded not to send any. Besides, I am not in favor of showing apples at the winter meeting that have been in cold storage and think none should be exhibited but such as would keep under ordinary conditions, as it may induce people to plant trees of varieties that would prove very unsatisfactory.

"My apples kept poorer this fall than ever before; I had them all gathered before I went to the fair, and when I got home I found them getting so ripe and soft, that I thought it would give me trouble to handle them. I had a standing offer for them at ninety cents per bushel cash if I would deliver them in good condition, but to do this and haul them fourteen miles in a wagon was difficult, seeing they were mostly white apples that would show the smallest bruise. But I did it and delivered nine loads with perfect satisfaction in the following manner: I took sugar barrels and

first drove a fence staple into each side of the barrel just below the top hoop; I then filled the barrel to within a little of the top with apples, then spread a sack over the apples and filled the remainder of the barrel with grass or weeds, packing it in firmly and piling it above the top of the barrel. I then took an old barrel stave, tied one end down to the edge of the barrel, and springing the other end down tied it to the other staple, thus making a spring that held the apples firmly without bruising them. My experience this fall convinced me that Minnesota apples if properly handled, don't have to go begging to market, for the demand outlasted my supply, although Rochester market was glutted with Southern apples at one dollar and fifty cents a barrel."

(We shall have to try and convince Mr. Corp that no harm comes to any one from an exhibit of cold storage fruit, and the object lesson is worth a great deal to the faint hearted who have no faith in fruit growing in Minnesota. We want a full collection of his fine fruit at our next winter exhibit, which we hope will much surpass the last.—Sec'y.)

FILLMORE COUNTY FRUIT GROWERS.

R. PARKHILL, CHATFIELD, SECRETARY.

A horticultural meeting was held on the 19th and 20th insts., at Squire Burleson's office in Spring Valley. The meeting was called to order at 2:30 p. m., Thursday. D. K. Michener was elected chairman, and R. Parkhill, sec'y. J. Marshall presided at the meetings Friday forenoon and afternoon, Mr. Michener not being able to be present.

The attendance was not very large, but much interest and enthusiasm was manifested by those present.

C. G. Patten, Charles City, Iowa; O. F. Brand, Faribault, Minn; and C. F. Gardner, Osage, Iowa, professional horticulturists, were present and gave interesting addresses during the meetings. Wm. Somerville, of Viola, attended and gave very valuable assistance by practical talks to farmers on the varieties of the different fruits suited to this part of the state and the care and cultivation of the same. He also spoke at some length of the large amount of money paid by the people of this state for Eastern apples, proving from his own experience that every farmer in southeastern Minnesota could, at very little trouble and expense, grow an abundance of fruit for his own use.

A society was organized to be known as the "Fillmore County Horticultural Society," and the following were elected officers for the ensuing year: D. K. Michener, president; R. Parkhill, secretary and librarian; S. F. Leonard, treasurer; and an executive committee consisting of the president, secretary, treasurer and B. Taylor and H. Moon.

It was decided to elect also one vice-president from each township in the county. Several of these were elected at the meeting, and the remainder will be elected at the next meeting of the society to be held at some convenient place in the county next February.

A constitution and by-laws, somewhat similar to that of the state horticultural society, was adopted. Any person can become a member by sending his name and fifty cents, the annual fee, to the secretary at Chatfield or the treasurer at Washington P. O.

Your Corner.

PEACHES.—Mr. A. F. Collman, (Iowa,) committee of awards on peaches and pears at late annual meeting, said: "I examined the peaches and I pronounced them very good. I do not see why you should be discouraged in growing peaches when you can raise such fruit as is exhibited here. The pears are very nice, but they are a little past their season. I see no reason why you should be discouraged in growing those fruits."

A **HORTICULTURAL CLUB** was organized at Nimrod January 1st, 1896, called "The Nimrod Horticultural and Improvement Association." There were eighteen members. The officers elected were:

President, Mrs. M. L. Williams,	-	-	Nimrod, Minn
Vice-President, Mr. Elmer Raines,	-	-	" "
Treasurer, Mr. Pat. McCoy,	-	-	" "
Secretary, Mrs. Dasie Morgan,	-	-	" "

Meetings to be held the first and third Wednesday of each month.

Respectfully submitted,

MRS. DASIE MORGAN, Secretary.

I see in the last number of the **HORTICULTURIST** the reporter makes me say in the discussion on "Fruit List," just the opposite of what I did say. What I said was "the Stewart is the best currant in our section, and with such kinds as the Stewart, Victoria and Long Bunch Holland we did not have any use for the Red Dutch." The published report reads: "Mr. Richardson:—In our part of the state the Red Dutch is ahead of anything else."

S. D. RICHARDSON.

Winnebago City, Jan. 9, 1896.

When the members get enthusiastic and several are trying to talk at once, as often happens, it is no wonder the reporter makes a few breaks.—**SECRETARY.**

A NEW PLANT.—"I wish to inquire if any member of the society has tested the *Poinciana Pulcherrima* in Minnesota as a house plant, and if so how it is regarded. With us it is the most beautiful and satisfactory small tree we have. It grows to be eight or ten feet high. A nurseryman of Oneco says of it: 'A magnificent window plant, combining the beauty of Mimosa leaves with gorgeous flowers; blooms continually on new growths.'

"By the way, trees were killed more extensively last winter than I ever knew them to be in Minnesota during the most severe winters of my residence there."

A. W. SIAS, Harbor View, Fla.

SPECIMENS OF FRUITS WANTED.—"I have been on the committee on nomenclature for a number of years, and I have here a book containing descriptions of some two hundred varieties of fruit that have been grown in Minnesota. I want to get hold of everything new that is produced in the state, and I take an outline of it and make a description, and everything that I have ever reported in these reports I have in this book. When I get the book completed I expect to have it printed and present it to the library of the horticultural society. I want the officers of the society to remember that the book is the property of the society, in my custody, except when I loan it to Prof. Green for the purpose of copying any description, and if anything should happen to me I want the officers of the society to secure that book and keep it. Now I have a request to make: If you have any new fruit, any seedling fruit, I wish you would send me one or two specimens. One may be a little cankered and not good for anything, so it will be better to send two. The specimens of fruit should not be bruised, and the stems must be left on. It should be in as perfect a condition as possible."—*Extracts from reporter's notes of late annual meeting.*

J. S. HARRIS, La Crescent.

A DESERVED HONOR.

MINNESOTA HORTICULTURISTS ELECT MR. AMASA STEWART, A LIFE MEMBER.

(Extract from a Texas paper.)

At the recent annual meeting of the Minnesota State Horticultural Society, Amasa Stewart of Lamarque, Tex., was unanimously elected a life member of that organization. Mr. Stewart was one of the original members of that society. He originated the "Stewart currant," now so famous in the Northwestern states; also the Stewart Sweet apple. He is held in grateful remembrance by the horticulturists of Wisconsin, Iowa and Minnesota. He was the state treasurer of the Minnesota society for many years.

Mr. Stewart is well known throughout this region of the coast country as one of the best authorities upon what can be successfully and profitably grown from coast soils. His extensive farm at Lamarque has been made more or less of an experiment station by Mr. Stewart, and the results achieved have been of considerable value to the farmers for many miles around Lamarque. The recognition by the Minnesota Horticultural Society is a graceful and deserved compliment.—*Texas Coast News.*

The gooseberry is budded and grafted on the flowering currant, which is a higher growing bush than the gooseberry. It is claimed by some that the fruit is superior in flavor, besides, it is quite ornamental.

Secretary's Corner.

ERRATUM.—A mistake in the financial report of the Secretary (see January number, page 15,) makes the expense of reporting the meetings \$39.35. It should read \$89.35.

DELEGATE TO WISCONSIN.—Mr. E. H. S. Dartt, of Owatonna, was chosen by the annual meeting as delegate to the annual meeting of the Wisconsin society to be held early next month. We shall look for a report from him in the March number.

STATE FAIR PREMIUMS.—The premiums on horticulture for the 1896 fair have been raised in the aggregate considerably. Fruits are increased about sixty dollars, flowers about forty dollars and vegetables sixty dollars. The premiums on county exhibits have been placed at a total of \$700, an increase of \$400, and this amount is to be divided proportionately amongst all the exhibitors, pro rata, depending upon the number of points of excellence each is awarded. This seems a very wise plan and could well be tried in other departments.

ANNUAL MEETING OF THE WISCONSIN SOCIETY.—The program of this meeting, to be held at Madison February 4, 5, 6 and 7, is at hand. The meeting is to be held jointly with the State Agricultural Society, which will probably give them a rousing attendance. A wide range of subjects will be considered, not the least important of which is the plan to be pursued in operating the new orchard experiment station for which the state made an appropriation lately. We are interested to know how they are going to do it. We hope Mr. Dartt, who is our delegate, may not go alone from Minnesota. Who else will represent us there?

MINNESOTA STATE AGRICULTURAL SOCIETY.—The annual meeting held January 14th, at St. Paul, was a very harmonious occasion. The president, Ed Weaver, of Mankato, and the vice presidents Wyman Elliot, of Minneapolis, and D. R. McGinnis, of St. Paul, were elected without opposition. On the executive board Mr. E. P. Watson, of Morris, was elected to succeed himself for the term of three years, and Mr. E. C. Cooley, of Duluth, took the place so long held by Hon. J. J. Furlong, of Austin.

The complexion of the new board is, I believe, very satisfactory to the people of the state, who are plainly in favor of a clean and wholesome fair and a full recognition on an equal footing of all the important interests.

Of course, we are especially pleased at the unanimous re-election of Mr. Elliot. The interests of horticulture will undoubtedly be fairly treated by this board. It has "many friends at court," but not more than deserved.

THE MINNESOTA HORTICULTURIST.

VOL. 24.

MARCH, 1896.

NO. 3.

THE ORCHARDS OF MINNESOTA IN AUGUST, 1895.— JOINT REPORT OF COMMITTEE.

CLARENCE WEDGE, ALBERT LEA.

PROF. S. B. GREEN, ST. ANTHONY PARK.

(Read at the annual meeting, Dec. 6, 1895.)

EXCELSIOR.

Your committee began its work August 5th at the home grounds and young orchard of Peter M. Gideon, where, as in several other places, our work was hindered by heavy rains. His orchard is situated in a clearing in hardwood timber, near Lake Minnetonka, on land of moderate elevation. The trees are about seven years old and were making a fair show of fruit. Considerable blight was present, as much as or more than in any other place we visited. The Florence crab was loaded heavily and seems to give promise of being an extra early bearer of a good general purpose crab for home use and early market. The Peter and the Wealthy were said by Mr. Gideon to be "right smart hard to tell apart." It is doubtless a case where the seedling has so clearly reproduced the parent tree that there is little, if any, choice in the two kinds. Mr. Gideon thinks that the dark red crab shown at our fairs by Mr. Somerville and others, as "Gideon's No. 6," is most likely his "Mary." Mr. Gideon's peach orchard was, on account of the May freeze, carrying very little fruit, but the trees were in fair condition and many of them four or five inches in diameter of stem.

It may not be generally known that Mr. Gideon has sold his old place, where the original Wealthy, Martha and other noted seedlings stood, and that his present orchard is a new plantation on a different spot. He informed us that the original Wealthy tree, or rather the sprouts from the same, were grubbed up by the parties to whom it was sold to make room for suburban improvements.

WACONIA

We next visited the orchard of Andrew Peterson, of Waconia. The location here is on land originally covered with hardwood timber, in a region interspersed with small lakes. The soil is a retentive clay, and the slope and exposure decidedly southern, with a

tendency to blight and sunscald. Of his planting previous to 1875, there is nothing now remaining but the Russian varieties, Hiberna, Charlamoff and Christmas, all of which are large fine trees in excellent health and prolific bearing. The other varieties noted below are of later planting. The Hiberna family, as he has it, under the three names of Hiberna, Lieby and Ostrekoff Glass, is looking extremely well all over the orchard and is spoken of by Mr. Peterson as his most profitable variety. His four oldest trees fruited before and after the hard winter of 1884-5 and have never been seriously injured by the severe blight which has been so prevalent in this orchard. Their trunk circumference is something over two feet eight inches and their spread of top thirty feet. The Charlamoff, of which he has two trees, is looking equally well and is a regular and good bearer of what Mr. Peterson calls his choicest fruit. The Christmas is a tardy but good bearer of medium sized, red apples of good quality and a mid-winter keeper. The single tree which he has of this variety leans to the north and has been injured by sunscald, but in every other respect is healthy and has never been subject to blight. This variety seems to deserve more attention than it has received.

Of the younger trees, Bode (385) was bearing very early and heavily; fruit medium size, yellow, brisk acid, somewhat similar to Antonovka in flavor but smaller and nearly ripe at the time of our visit; tree hardy and particularly free from blight. Blushed Calville is more subject to blight than some varieties, but the trees are still in good condition and bearing such extra choice early apples that Mr. Peterson regards it very highly. The one tree of Patten's Greening was a very fine healthy specimen, an early and heavy bearer and esteemed by Mr. Peterson as among his best. Cross (413) is proving a good tree and a heavy bearer; fruit keeps better than Wealthy; trees were well loaded at the time of our visit and presented a fine appearance. Ostrekoff (4 m) and Lead (3 m) were blighting very badly and appear unworthy of cultivation. Rambour, Queen, Grandmother and Rosy Repka are proving very tardy bearers. Komska Reinette is bearing early and well, but the apple as we tasted it later at the fair was soft and insipid. Borovinka (245) is very similar to Duchess but a much better keeper. Anisim is an extremely heavy bearer and a choice though somewhat undersized apple; trees very free from blight and generally healthy, but two trees standing in a particularly dry soddy spot show signs of failing, probably on account of lack of moisture in the soil to supply the drain of such extreme fruitfulness. An old tree of the Minnesota crab is looking very healthy and is a profitable bearer. Several trees of the Peerless were looking rather the worse from their habit of making a late fall growth, but were free from blight and showing a tendency to early bearing. On the whole, while the soil, general location and the good care this orchard receives are in its favor, yet as it has long been known as a place where blight and sunscald were very prevalent and where all the old trees of Duchess had failed, we think the good behavior and present profitable condition of such a number of Russian varieties is greatly to the credit of that race of apples. These kinds that have stood well here are likely to at least resist blight elsewhere, and, as this

orchard is situated in about the latitude of St. Paul, it should be a great encouragement to all orchardists south of that parallel.

FARMINGTON.

Our next exploration was in the direction of Farmington, by the way of Minneapolis and Ft. Snelling, using our bicycles. We noted on the road from Ft. Snelling south the almost total absence of anything like a good farm orchard in all the 25 miles, and it was a genuine pleasure to look over the fence three miles south of Farmington and see such a comfortable orchard of good old trees on the pleasant homestead of W. L. Parker. The Duchess here seems entirely healthy and the Tetofsky a good and profitable tree. The Hibernial was heavily loaded with its third consecutive heavy crop. The Minnesota crab, is large, healthy and bearing well. The Virginia crab is a favorite a fine bearer; fruit generally larger than Transcendent, a better keeper and fully as salable. There is nothing in the location of this orchard that would seem to make it very favorable. It is on a rather level prairie and with slight protection except from natural groves at some distance. Mr. Parker's success is doubtless largely due to persistent, intelligent planting of the best varieties.

LAKE CITY.

With considerable regret that we were unable to visit other orchards in the vicinity of Farmington, we left the highway and took the cars for Lake City, where we arrived late at night, but not too late to receive the cordial greeting of the president of our society. On the following day, we visited the orchards and grounds near the residence, which is situated on the bench below the bluffs of the river. One fine orchard of Duchess and Wealthy, which had arrived at profitable bearing age, has entirely failed on this site, and the later plantings do not indicate that this is a favorable location, although old trees of several varieties of crabs and hybrids are standing in fair condition, Early Strawberry, Orange and Pickett's Prolific among them. The latter is a fruit of good size and the tree exceedingly prolific.

On this, their main nursery grounds, we noted a very fine and perfect stand of spring set strawberries. They use a transplanting tool and plant quite closely in the row. We also observed the great beauty, hardiness and drouth-resisting qualities of juniper savin as a hedge plant. It should entirely supersede the arbor vitae. In another part of the grounds on somewhat higher land sloping to the north, we were shown an orchard planted ten or twelve years, in a soil quite sandy and too dry for the best health of the trees. In this was a large variety of Russian and seedling trees coming into full bearing, but whose names were lost and many of which we were unable to identify. The Hibernial was there in superb health and heavily loaded, the Anisim was easy to identify with its tremendous load of rich red fruit, showing, however, some of the weakness found at Mr. Peterson's place. Antonovka was a fine tree nearly free from blight and no show of past injury from that cause. Yellow Transparent was blighting severely. A tree strongly resembling the Bode

found at Mr. Peterson's was looking very fine, and an excellent crop had just been gathered from it. Some fifty trees of the Okabena situated on the lower and most sandy edge of the orchard were looking very healthy and bearing early and abundantly; the fruit averages of fine size and high color and quality. This orchard abounded in interesting varieties, but the names being lost we were unable to make any report on them that would be of much value.

We were next shown Mr. Underwood's "bluff orchard," planted on the north slope and near the top of a steep bluff. Although the trees in this orchard have been quite recently planted and have as yet borne only specimen apples, we were impressed with their healthy, vigorous appearance and with the great promise that such locations give of being valuable, if not our best orchard sites. The land has never been broken up, as it is entirely too abrupt a slope for agricultural purposes, but the original forest has been cut down and the trees planted in large holes and kept well mulched, and with the natural cool, moist forest soil and the water and air drainage which the apple delights in, there is every reason to prophecy a grand future for this orchard.

MINNESOTA CITY.

A short visit to the interesting grounds of O. M. Lord, of Minnesota City, was our next move. Plums and stone fruits generally seem to be at home in this alluvial valley soil, but we also found many varieties of apples, including some new seedlings, looking well, although blight has been severe in late years. The Rollingsstone and Cheney are among Mr. Lord's favorites, the former on account of its high quality and fine shipping character, the latter on account of its earliness, size and fine flavor. The Cotterell, Hall's Peach, Comfort, Gaylord and many others are promising. Russian plums are decidedly inferior in appearance and fruitfulness of trees to the best American varieties, although they may improve with age. Mr. Lord has a number of peach trees of several varieties that are in bearing and that look healthy and promising. The fruit, like most of the Minnesota grown peaches we have tasted, lacked in richness and flavor and does not give much encouragement to continue this somewhat expensive experiment. While the soil at this point appeared to be light, permanent moisture seems to be within easy reach of the roots of trees and plants, making it almost an ideal location for most fruits except the apple, for which it is lacking in elevation.

LA CRESCENT.

We arrived at the home of "our" Mr. Harris, of La Crescent, late in the evening of August 7th. We were expecting to spend the early morning hours of the next day in looking over his grounds, which are, perhaps, the most interesting of any experimental grounds in the state, but a heavy shower began very soon after daylight and our opportunity of doing any valuable work at this place was about spoiled. The orchard here is situated on the lower slope of the bluff, which rises to the height of several hundred feet. The orchard and vineyard form a semicircle, enclosing a fruit and market garden of several acres. This arrangement taken in connection with the view

of the river and the city of La Crosse in the distance, makes a highly artistic and beautiful home for this pioneer of Western horticulture. We found several varieties of pears in full bearing; the Flemish Beauty in particular was a rare sight. The Whitney apple is here a tardy bearer of inferior fruit, although the tree is quite healthy. The Utter, Price's Sweet, Fameuse and Perry Russet were found in bearing, the latter a survivor of '85. The Darrt was in heavy bearing, as is its habit here in alternate years. The Antonovka was looking well, blighting but little. Quite a number of Plumb Cider were in bearing. The Daisy apple, originating at the same place as the Okabena, was a fine upright tree, nearly free from blight and a full bearer of good fall fruit. The old orchard of Cheney plums, which was just ripening at the time of our visit, was a fine sight with its heavy load of bright red fruit. Mr. Harris calls it his most profitable plum. We ought not to omit a notice of some of the fine ornamental and nut bearing trees which adorn the place. Both the sweet chestnut and shellbark hickory were in bearing, and several most perfect trees of white and Norway spruce were standing at least forty feet high. The location of this orchard appears to be quite favorable, and Mr. Harris is encouraged to start a new plantation still higher up the bluff.

VIOLA.

At noon of this same day, by the aid of our wheels, we took dinner with William Somerville of Viola. We were sorry to find that his fine orchard had recently been visited by a severe hailstorm, destroying a large share of a fine crop of apples. Our attention was first called to the Sweet Russet crab, which is a fruit of good size, nearly as large as the Whitney and very choice to eat out of hand. The tree is healthy and hardy and highly valued by all who have tried it as a fruit for home use. Gideon's No. 6 (Mary?) is his best all around crab; very attractive rich red color and good size; tree hardy and perfect. Malinda top-worked on Transcendent about twenty years, was bearing heavily and, although severely injured ten years ago, is now in good health. Brett No. 1 (the large red apple) was a very perfect young tree bearing some fruit and highly thought of by Mr. Somerville. Juicy Burr appears to be a close relative of the Hiberna, and all trees of that family were looking very healthy and proving early bearers. Zuzoff's Winter was looking well, Longfield healthy and bearing well; Glass Green is of the Duchess family, but the fruit keeps a little better and the tree branches somewhat differently.

Rollin's Prolific is here quite healthy and one of the best keeping apples in the orchard. Nearly all the trees of the Anis family are very healthy and extremely hardy, but shy bearers. The Russian Green seems to be an exception to this rule and bears heavily on alternate years. The Titus resembles the Tetofsky but is not sufficiently productive. Red Black is a healthy and prolific tree, bearing a large, good fruit. Repka Malenka is a very fine, healthy tree bearing a true winter apple of good quality, a variety that Mr. Somerville thinks is about the safest of the late keeping varieties for our climate.

We would not neglect to mention the famous orchard of fifty Duchess now over thirty-two years old, nearly every tree of which is still standing and promising to be useful for another generation; or the grand tree of the Transcendent which measures over five feet in girth of stem. Mr. Somerville is practicing a system of in-arching, or connecting the opposite branches of natural forks with a living branch, and thus saving many valuable trees from danger of splitting down in this weak point. The connecting branch soon grows to a large size and makes a union of such strength that no strain of high winds or heavy fruiting will be likely to break it. The subsoil of this orchard is a retentive, yellow clay, underlaid with limestone at a depth of fifteen feet. The exposure is northern, and although quite sheltered has excellent air drainage from a ravine that starts from a spring not far from the lower edge of the orchard and which connects with deeper valleys. The spring indicates that the limestone is water-bearing and that the roots of the trees have not far to go for perpetual moisture.

ROCHESTER.

The orchards of R. C. Keel, on the old Jordan farm, near Rochester, were visited on the afternoon of the same day. We were much interested in an old jack pine, planted near the house. It was in good health and must have measured a foot in diameter of trunk, the only tree of its kind we have seen outside its native pineries. The trees of all kinds show the effects of the severe drouth of 1894 and that the high bluff upon which this farm is situated does not have as moist and retentive a soil as is desirable.

A row of large white and Norway spruces was an interesting object lesson as to the relative ability of the two spruces to resist drouth, the former enduring far better than the latter, many of which were dead and all looking brown and parched. Here, as at Mr. Parker's place, we found the Virginia crab much better liked than the Transcendent, Mr. Keel saying that it bears better, keeps better and takes better on the market, and he would plant ninety-nine Virginia, to one Transcendent. We noted one tree of the Virginia standing alone that had developed into magnificent proportions, the grandest tree of the apple kind we have seen in the West. Old trees of the Malinda top-worked on the Transcendent were in good condition and profitable bearers. Longfield on Orange crab were rather dwarf in appearance, but healthy and exceedingly prolific. Standing, as they were, in matted blue grass sod, the fruit is sometimes very small, especially in dry seasons. The Wealthy was killed to the ground in 1884, but is now bearing well from sprouts. The Gilbert is a variety that is quite promising at this place and also highly esteemed at Mr. Somerville's; fruit is somewhat like Duchess but considerably later, and the variety is readily distinguishable from the Duchess in the nursery. A large orchard of mature Duchess trees, planted rather closely, were affected almost ruinously by the drouth of 1894, although admirably mulched and altogether free from sod. It would seem that some artificial supply of water was in many cases almost a necessity for closely planted trees in dry seasons when bearing a heavy crop. The orchards at this place,

being very much scattered and occupying in irregular order a large amount of ground, are difficult and expensive to care for in a thorough manner.

HAMMOND.

We next had the pleasure of visiting the noble orchard of Sidney Corp, of Hammond. The main orchard at this place is situated on very elevated land sloping towards the east and well protected by natural groves on the south and west, somewhat protected on the north but entirely open to the east. Although on a high elevation in rather a broken country, a well near the orchard only sixteen feet deep has, up to the present, furnished an abundant supply of water, thus indicating that there is moisture present in the soil. But the magnificent health of the trees and the fine crop of large apples in the orchard spoke most eloquently of favorable conditions and good care.

The trees are planted a rod apart each way, and while there is grass in part of the orchard it is all well mulched and enriched. As at Mr. Somerville's place, the Anis family were exceedingly fine trees but unprofitable bearers; fruit of excellent quality but rather below medium size. Duchess unusually high trimmed but in perfect health at twenty-eight years old. Autumn Streaked, twenty-two years old, an unprofitable bearer and bad blighter but a large handsome fruit. Five trees of McMahan, set twenty-two years, are fine, perfect trees in profitable bearing ten years. Wealthy looking very well are scattered here and there through the orchard, but, as we approached a tree of Brett No. 1, Mr. Corp remarked that this was, in his opinion, the best Minnesota seedling he had tried.

The Giant Swaar is here a tardy but heavy bearer; White Pigeon a good tree bearing a particularly beautiful, early fruit of fine quality. Several trees of the Avista were blighting badly, worse even than the Autumn Streaked; Hibernial, a perfect tree, bearing well. Mr. Corp showed us his tree of Anisim, twelve years set, as "his best Russian." The tree is hardy, perfectly free from blight, a somewhat tardy but exceedingly prolific bearer from the time it begins to bear; fruit nearly as dark as Hyslop in color and keeps rather better than Wealthy.

Some time after our visit, while at the state fair, Mr. Corp informed us that he picked over sixteen bushels from this single tree, which cannot measure more than six inches in diameter of stem. We noted a tree of Plumb Cider in bearing, also that the Early Strawberry crab was much prized. The glory of the orchard was, however, the grand apples of McMahan White, which hung in great profusion from trees that would be a credit to any Eastern orchard. This location is so evidently of the most favorable kind that it will not be safe to reason from the behavior of a variety here that it will be safe to plant it in the average orchard, even in this portion of the state.

OWATONNA.

It was but a few hours' ride from this most favored place to one of the most trying locations in Southern Minnesota, the orchards of E. H. S. Dartt, of Owatonna, where we arrived just in time to have

our plans spoiled again by a heavy shower. The following day was devoted to looking over the orchards as well as the tree station which is under Mr. Dartt's charge. The soil here is a retentive clay and the locations generally high with good air drainage, the latter being one of Mr. Dartt's well known hobbies. The Duchess is by far the most commonly planted but is not standing very perfectly as an old tree, sunscald and stem-weakness being very common. The trees have, however, been quite profitable, and Mr. Dartt has sold as high as 1,000 bushels in a single season, mainly Duchess. The Minnesota crab is doing well, rather better than the Early Strawberry. The Greenwood crab is an extra hardy, extra early bearer, very free from blight, prolific, and fruit is of good size. The Whitney is a tardy and moderate bearer. The Dartt makes a fine orchard tree, very hardy and free from blight; fruit about the size or larger than the Whitney; a seedling of the Tetofsky.

In the tree station orchard, the Hibernial is about the finest appearing tree and is bearing early; Avista blighting; Patten's Greening bearing some very fine fruit, showing very little blight; Florence crab looking well, no blight, fruiting; Yellow Sweet a fine tree; Early Strawberry crab blighting considerable. All the varieties mentioned above after the Hibernial are young trees just beginning to fruit.

We found the tree station kept in admirable order and the private orchards all cultivated and highly manured. The seedlings at the station nursery were a remarkably even, fine looking lot, making a far more presentable appearance than the average Northern nursery of standard varieties. Careful record is kept of the position of the various varieties on trial and also of the parentage and location of a large share of the station seedlings. It is no flattery to report this work a credit to the state and one of the most valuable auxiliaries to Northern horticulture.

WINNEBAGO CITY.

Our next visits were made about two weeks later and occupied but one day's time. We first looked over the nursery and experimental grounds of S. D. Richardson, of Winnebago City. While none of the orchard trees have been planted very long, and few have fruited, we were surprised to find such varieties as Rawle's Genet and Iowa Blush in fair condition. Mr. Richardson received his Russian varieties from the Minnesota Central Station some years ago, and, while he happened to get a few good kinds, it was, like all sent out at that time, very far from a select lot of varieties. We noted the Peerless set several years and that it was not of very promising hardiness. Mr. Richardson stated that it showed no indications of being harder than Rawle's Genet. Crampton No. 3 is a very promising crab and the Oligier seedlings seem worthy of quite general trial in our stations. The Mankato plum is a favorite, and trees of a German cherry are looking very healthy.

The orchards about Winnebago City are in many respects the best we visited. The Holly orchard, about two miles north of the city comprises about one thousand trees, nearly all Wealthy; it was set about twenty years ago, and bore 150 bushels of apples the summer

of 1885. The trees are generally in fine condition, showing exceptionally healthy trunks for that variety and almost perfect freedom from blight. Nine hundred bushels of apples were sold from this orchard in 1893, bringing \$1.00 per bushel *on the trees*; the following season 750 bushels were sold at seventy-five cents per bushel; the freeze of last May ruined this season's crop. We noted one fine healthy tree of the Malinda in this orchard. The orchard originally covered ten acres, but part was set in low, unfit land; a fire has run through a portion of it, and, having always been in the hands of a tenant, it has stood in blue grass sod, utterly without nurture or care. The number of old trees of this second hardy variety in perfect health is certainly surprising.

A half mile nearer the city is an orchard covering perhaps an acre, composed of Duchess, Wealthy, Minnesota and Haas, old trees in almost perfect condition, standing with very few vacant places. In the outskirts of the city is a small orchard belonging to lawyer Dunn, where old trees of the Wealthy are in the same fine condition as in the other orchards hereabouts and also good old trees of the Haas, Malinda and Perry Russet.

FAIRMONT.

After partaking of the kind hospitality of friend Richardson, we departed on our wheels for Fairmont, about twenty miles distant. Although we did not stop to make any examinations on our way, we noticed that there was an unusual number of comfortable orchards and gardens about the farmhouses. About a mile east of Fairmont, we stopped to view the orchard of F. S. Livermore. We found the trees bearing a very fine crop, having in some way escaped the freeze of May, and the show of fine healthy old trees of Tallman Sweet, Utters, Fameuse, Walbridge and Haas, besides the Duchess, Wealthy, Whitney and several seedlings, was a sight that very much astonished us. Certainly, a remarkable collection of trees for this latitude. The location is but slightly elevated, the slope is gently to the south, and the site very closely sheltered on all sides. Everything in this section, including Faribault and Martin counties, indicates that it is a natural orchard region, probably the best in the state. It is difficult to determine what should make it so, as the finest orchards, while not on low land, are not on particularly elevated sites and do not seem to be favored by any assignable circumstances in their surroundings or care, and we seem drawn to the necessary conclusion that their success must be largely due to some favorable quality of the soil.

ALBERT LEA.

One member of the committee, S. B. Green, was much interested in looking over the grounds of the other member of the committee, that is, the grounds of Clarence Wedge of Albert Lea. These are situated about two miles from the depot, on rather high land, overlooking a lake that is fast drying up. The fruit trees here are particularly thrifty and promising. Most of the trees of bearing size have been planted about ten years, but some Duchess trees twenty

years old are vigorous and sound. The Wealthy does not seem to do as well here as farther west near Winnebago City.

Mr. Wedge says that the Russian apple, Yellow Sweet, is a fine sweet fruit that ripens August 1st. The trees have been planted eight years and are sound and good. It is a rather tardy bearer. Hibernial is here an early and heavy bearer, fruiting younger and more heavily than Wealthy, and is proving an excellent stock for top-working. The trees are eight years old and are in perfect condition. Charlamoff fruits regularly and younger than Duchess. The trees have been planted ten years and are sound, though they have blighted a very little. Malinda top-worked on Hibernial had here come into bearing, while the tree on which it is worked had not produced any fruit. Longfield seems to be perfectly at home here. The trees are in perfect condition and are early, regular and heavy bearers of excellent fruit. Repka Malenka makes a good tree and is standing well, but is not as hardy as Duchess. It has fruited several years; the fruit is small but keeps all winter. Mr. Wedge thinks highly of it. McMahon White is doing well here. Russian Green is here, as generally elsewhere, a light bearer though making a good tree. Antonovka fruits some but blights quite a little. Tetofsky does well; Summer Lowland is a tardy and light bearer; so far Czar's Thorn is doing fairly well; 4 M, which is a green apple with a long stem, blights badly.

Of plums, the Rockford, Stoddard and Blackhawk were bearing well. The Stoddard was received for the Rockford, which is the second similar case coming under our notice. The white pine sun-scalds badly here, while the Scotch and dwarf Mugho pine are doing well.

RICHLAND.

The Miller place, at Richland, in Rice county, was visited by one member of the committee. Its location is high prairie, having retentive soil. The orchard is made up largely of seedlings. These are near the house and enclosed by a high windbreak on all sides. It was a great surprise to find so many very good seedlings in such a small compass. Most of the trees were well loaded with fruit. Notes were taken on fifteen different seedlings growing here. The original Peerless tree had a very heavy crop of fruit. It is, however, seriously injured by splitting in the crotches and is held together with a chain.

AITKIN.

From Aitkin, which is almost due west from Duluth, one of the committee drove ten and rowed three miles to Bay Lake, which is situated between Bay and Faun Island lakes, and visited the home of Mr. Otto Wasserzicher, which is pleasantly located on heavy white pine and maple land, which is, he believes, always good fruit land. There is much very excellent farming land in this vicinity, and it can be bought very cheap, but the expense of clearing it is so great that it is not being taken up as fast as it deserves to be. There are some very good roads in this section and many that are very poor. Mr. Wasserzicher's place is located on high land sloping to

the north and south. He raises raspberries, strawberries, grapes, plums, currants, gooseberries, apples, cherries, etc. His raspberry bushes are unusually healthy and vigorous. The fruit from these he ships to Minneapolis, where they net him about 15 cents per quart. His grape vines are very thrifty and generally produce abundantly, but the blossoms were mostly killed by the late frosts last spring, so he had little fruit and this very late. However, from a Delaware vine growing against the house, he had on September 16, the time of our visit, some very nice grapes, thoroughly ripened.

He has quite a few Russian apples, trees that he received from Professor Budd, including Hiberna, Juicy Burr, Charlamoff, Steplianka, Prolific and 38 Vor. Most of these trees look exceedingly well, and a few of them have borne a little fruit. He also has October, Virginia, January and Florence. The Florence crab has been very productive, while several other Gideon seedlings have blighted badly. The Peerless trees, of which he had three, are all dead but one, and that is severely injured. He has recently put out quite a large planting of apples on a north slope, which at the time of our visit he was cultivating in corn. The four or more varieties of Russian cherries, which must have been planted four years, are very flourishing. He grows some seedling apples each year and takes great pleasure in the work. His Red Cloud seedling apple was exhibited at our last state fair and attracted much attention. The tree, however, seems inclined to blight.

He has several kind of grapes, including Cottage, Delaware and Concord. His collection of plums embraced some Russians and named and unnamed native kinds. These are doing well, though his crop this year was nearly a failure. He had an extra good vegetable garden in which was growing, among other things, some very fine Savoy cabbage. The home buildings are large and comfortable and made of logs. Surrounding the house was a nice lot of annual and perennial flowering plants that showed that some one loved and cared for them. Take it all in all, this place showed plainly to your committee that we have rather overlooked the horticultural possibilities of the northeasterly part of this state.

KIMBERLY.

At Kimberly, twenty miles east of Aitkin, a member of your committee had a very enjoyable visit with our friend, H. B. Ayres. In this section there are no graded roads and but little cleared land, and no fruit is raised, but large amounts of vegetables were produced the past season. There is much ignorance here as well as elsewhere among the people of the northern part of this state in regard to the varieties of fruit best adapted to their conditions.

DULUTH.

At Duluth we attended the St. Louis county fair, where the show of vegetables was particularly good. There were practically no apples or crabs in this exhibit, owing to the late frosts of last spring. At the fair here a year ago, which a member of your committee visited, there were several plates of good apples. The only show of

plums consisted of a plate of Green Gages that were grown in Duluth. The show of cut flowers and decorative greenhouse plants was exceptionally good. In traveling through the woods in this section, the mountain ash was frequently seen growing wild and seemed to be well adapted to the prevailing conditions and was heavily loaded with fruit. It would seem that in any section where this tree does well some varieties of the best apples could be successfully grown. There was an abundance of water in N. E. Minnesota last summer, and the streams and lakes were full at the time of our visit.

LONG LAKE.

The orchard formerly belonging to C. W. Gordon, at Long Lake Hennepin county, was visited by one member of this committee in company with Mr. A. H. Brackett. It is located on high land, sloping mostly to the north. The land is a retentive clayey loam with clay subsoil. Many of the Duchess and crab trees are old, and some of them have died back and sprouted from the roots, but the sprouts are generally healthy and fruiting heavily. Among the younger trees, of which there are a large number, are Hibernial, Wealthy, Longfield and Duchess. These are all doing well and were fruiting heavily at the time of this visit. Large trees of Pride of Minneapolis and Virginia crabs were heavily loaded with fruit. Here as in some other places visited, the Virginia crab apples showed a zone of a russet color near the basin, which we think due to the late spring freeze. This orchard produced a large amount of apples this year and, if well cared for, bids fair to last for many years.

SUMMARY.

Although in making up this report we have endeavored to give the facts as far as possible so that each might draw his own conclusions, we presume that a summary embodying some of the opinions we have formed or had strengthened by our visits, might be of interest to the society.

As regards orchard sites, it appears that river valleys, bottom lands or benches are the least desirable, being generally of an alluvial sandy or gravelly nature, subject to severe drouth and consequent root injury and general debility of the trees; and in such locations, especially if closely hemmed in, blight seems to be particularly prevalent. Elevated locations with a retentive subsoil and, if possible, veins of water within reach of the roots of the trees, seem to be most favorable. North slopes are best; even steep and bluff hillsides of little or no value for agricultural purposes, if sloping to the north and possessing a clay or limestone subsoil, where forests naturally thrive, are valuable orchard sites and should be more generally utilized for this purpose. We find orchards doing well in both open exposures and when closely sheltered, and think it likely that the matter of shelter may be of less importance than many suppose.

As to varieties: We find the Hibernial quite generally planted and looking extremely well everywhere; it is doubtless even hardier

than the Duchess and about as productive. Our society has made no mistake in recommending it. The Charlamoff has had a long trial and is proving so good in tree and fruit that it may be about time to place it on the list for general planting. The Anis family are in general very fine trees, but unprofitable bearers; the Russian Green may be an exception as to bearing. The Anisim is a tardy but extremely heavy bearer of choice fruit; the tree will need good care and rich ground in order to maintain its health when bearing such heavy crops. The Antonovka may not be as bad a blighter as has been supposed; it was looking quite well in a number of places. Longfield was looking very fine everywhere; however, as there seem to be no trees old enough to have stood through our test winters, it may be well to plant it with caution. The Whitney, while looking well as a tree, seems quite variable in fruiting, and in some places is a tardy and unsatisfactory bearer. The Malinda will doubtless be best as a top-worked tree, and the Repka Malenka being a much earlier bearer, an acid apple and rather hardier in tree, may be better as a long keeper for the home orchard; it is rather too small a fruit for market. Ostrekoff (4 M), Transparent and Avista blight too much to be worthy of further trial.

Of the newer seedlings, Patten's Greening, Okabena and Peerless are all very free from blight and inclined to early bearing; the latter does not, however, ripen its wood well and shows strong indications of lack of hardiness. Brett No. 1 seems to deserve more attention than it has thus far received. We do not find the Russian varieties, as a class, any more subject to blight than the American, and, as a rule, they are of far superior hardiness.

Of the crabs, the Virginia is proving of great value, and on account of its freedom from blight and the better keeping quality of the fruit should largely, if not entirely, supersede the Transcendent. The Minnesota is doing extremely well everywhere. The Early Strawberry, Martha, Mary, Florence, Sweet Russet, Greenwood and several others appear to be quite safe varieties.

We cannot but recognise the fact that such a report as this would be of far greater value if made after a series of hard winters had shown up the weak points of the large list of varieties now on trial in our state. We also could wish that we had been able to take more time for our visits and made more thorough work of examination at each place. But, such as it is, we have endeavored to report without fear or favor, and trust that the report may prove as valuable to the society as the examination was interesting and pleasurable to ourselves.

Torenia Fournieri is a beautiful annual, being covered until late in the season with one mass of bloom. The flowers are large, and sky blue in color, dotted with three dark blue spots, and a yellow throat. T. Bailoni is a newer variety, bearing yellow flowers, with a brownish red throat.

Mignonette Machet is decidedly the best of mignonettes. It is of a strong, bushy habit and bears large spikes of bloom, brick-red in color and deliciously fragrant.

APPLE TREES ON THEIR OWN ROOTS.

JOHN NORDINE, LAKE CITY.

For the past few years the cry of the intelligent buyer of hardy roses has been, "Give us roses on their own roots," and today roses on their own roots will command a much higher price than budded roses. This cry for roses on their own roots leads us to the consideration of apple trees on their own roots. I think, to secure this result, the best way is to make our grafts with a long scion on a short root. By a long scion, I mean one that is six or seven inches long, while the root should be about three inches long. This makes a graft about nine inches long when ready for setting, and they should be planted deep enough to leave only about one-half inch above the surface. By planting in this manner, you get the union of the graft deep enough below the surface of the ground so that all circulation of air is prevented; besides, at that depth below the surface, the moisture is more evenly distributed, and this will cause the scion to throw out a system of fibrous roots above the union. (See figure No. 2). This leaves the young tree established almost wholly on its own roots.

In this locality where the winters are so severe as to necessitate the planting of only the hardiest varieties, iron-clads, as they are commonly called, it is necessary to have the roots equally as hardy as the tops in order to prevent root-killing. The advantage of this getting our hardy iron-clad fruit trees on their own roots is that they are as hardy and calculated to resist as severe cold *below* the surface as above the ground. That is, the roots have the same resisting power against cold as the tops, being, in fact, identical.

Many nurserymen, particularly those of the East and South, do not fully understand and appreciate the importance of this, but graft or bud their apple trees on tender seedling stocks above the surface or with very short scions and long roots. When such trees are set in orchards with any part of the tender stocks above or near the surface, as they often are, the trees almost invariably die from root-killing. In this case the whole tree and even the entire orchard dies, notwithstanding the iron-clad variety of the trunk and limbs. That so many nurserymen in the milder sections refuse to recognize this important principle may be the cause of so great mortality in Eastern and Southern grown trees when transferred to our severe climate.

Again, the commercial apple seedling sold for root grafting is usually grown from imported French crab apple seed. The variable and unknown character of these roots with regard to hardiness and vigor has been recognized for a long time by the more intelligent nurserymen who are making an earnest effort to render the growing of apple trees a success beyond the forty-fifth parallel. Owing to the high price of labor in the United States, it is impossible to secure selected apple seeds from matured samples of native apples, hence we are compelled to resort to some other method of obtaining hardy apple trees that will withstand the rigors of our climate.

Individual effort may be successful in securing an orchard by top-grafting, but some other plan must be found to supply the

EXPLANATION OF PLATE.

No. 1. Samples of young trees grown from roots grafts with short scion which have not rooted from the scion and have only the original root to depend on, and are very liable to root kill in this climate.

No. 2. Samples grown from root grafts with long scions set deep enough in the ground so that roots have grown from the scion. Judging from these samples young trees that strike out roots from the scion make a closer union also with the root upon which it is grafted, as the union is not easily discerned in these as in No. 1.

No. 3. This is a sample of a budded tree. When budded upon our common seedlings they are liable to root kill whenever we have an open winter and but little snow. The sample shows a trace of black heart in the root already. Again, the bud is necessarily inserted above the ground, thus leaving the less hardy stock exposed and subject to injury. There is no possibility of the scion putting out roots, and if the tree is injured so as to render it necessary to cut it back, it is absolutely worthless. All intelligent horticulturists agree that budded apple trees are inferior to grafted trees where they are to be planted and grown in a severe cold climate. These photographs are taken from genuine sample trees.

general buyer. The intelligent grower of nursery stock who would succeed in this latitude must give the closest attention to every detail of his business, from the selection of his roots and scions, the manner and method of union, to the growing, pruning and transplanting of his trees, etc.

As the result of much thought, close observation and many experiments, I am convinced that the scions should be selected and preserved with the utmost care, that the seedling roots should be grown as nearly as possible from seeds of hardy apples and that the use of a long scion and a short piece root will, in every instance, produce better results than the old practice as usually observed. By all means, use the long scion with a short piece root, and set the grafts in the ground to the top bud and give them thorough cultivation. The piece root will serve as a temporary support, whilst a root system is being developed upon the scion.

As stated above, using a long scion insures getting the root down well into the ground where there is permanent moisture, hence, a much larger proportion of your grafts will live, and at the end of the usual three years in the nursery this piece of the seedling root is sometimes entirely absorbed or falls away of itself when the trees are dug. In this manner apple trees upon their own roots can be obtained. Even scions with three buds often emit roots, but the scions are not long enough to reach down into uniformly moist soil; and, again, there are some varieties which do not strike roots on the scion very freely, but the majority of the so-called iron-clads will do so if encouraged by favorable conditions.

In securing our supply of apple seeds, we should be careful to get seed that is fresh, as that which is old or has been dried too much does not germinate readily but comes very unevenly and produces a weak and unhealthy seedling. We much prefer our native American or the Russian seed; while it is not as cheap nor as free from foul stuff, we are satisfied we secure a much healthier root on which to place our scions.

In conclusion, I would advise all intelligent growers of apple trees designed for the Northwest to give this method a thorough trial. Even though it costs more to grow trees in this manner, your success will more than repay the extra expenditure; and, again, I would advise all purchasers to buy trees on their own roots where it is possible to obtain them, even at an advanced cost.

The result of my experience and observation has convinced me that I am on the right track. Try it for yourself and be convinced also.

DISCUSSION.

Mr. A. J. Philips, (Wisconsin): You said nearly all of the ironclad varieties would grow readily. Are there any varieties that will not grow?

Mr. Nordeen: There are some varieties found that will not throw out a root the first three years.

Mr. Phillips: What varieties throw out roots first?

Mr. Nordeen: The Duchess do the best.

Mr. Philips: Do the Tetofsky do it?

Mr. Nordeen: The Tetofsky will throw out roots, too, but it is harder to get them to throw out roots.

Mr. Philips: Are those grafts tied or wrapped with wax before you put the paper on?

Mr. Nordeen: No, they are just wrapped with paper.

Mr. E. H. S. Dartt: I have not a doubt but that a hardy tree on its own roots is better than a tree that is on a seedling root. I have made some cuttings from seedlings and have got some started. Those other trees might have been hardy if the roots had come from the scion, but if we take the root cuttings we are sure we have got it. Those I have are very sure. I think that applies to plums with a greater force than it does to apples. A plum tree on its own roots is liable to throw out sprouts and suckers, and we can get a good lot of trees, whereas, if grafted on the wild root, the ground will become full of worthless sprouts. I am in favor of trees on their own roots if you can get them.

Mrs. A. A. Kennedy: A while ago I had some trees budded on the Hibernial, and last spring they died from root-killing and weakness. When Mr. Wedge was at my place I pulled one up; it was a budded tree, budded on the Hibernial. We got all the old root system and the entire lower part of the root which had come from the root that had been grafted; those roots were entirely dead without exception, and the only roots sustaining the tree at all were three or four roots from the original graft. The small roots thrown out from the graft were alive and seemingly thrifty, but not enough to sustain the tree. These roots were near the surface of the ground, and if the tree had not become weakened by the action of the drouth they would not have suffered so much. It struck me that with the Hibernial family, at least, if it had had a larger root and a year more time it would probably have had strength enough on its own stock to carry the thing through.

Mr. Pond: How do you get your root cuttings to grow?

Mr. Dartt: Well, we have an original plum tree to take the roots from, keep them until spring and then set them out. plums and apples both.

Mr. Kennedy: Would you set them even with the surface of the ground?

Mr. Dartt: I endeavor to leave mine just a little below the top of the ground.

Mr. Wedge: I would like to ask Mr. Nordeen what their practice is with apple trees in the nursery. Do you cut them back to the ground so as to get a straight trunk?

Mr. Nordeen: Sometimes we cut them off to the ground. When we are short of scions we cut them clear down to get scions, and that does not seem to hurt them any.

Mr. Wedge: What sort of tree do you get from that the second year?

Mr. Nordeen: That depends upon the condition of the tree when it is cut back. If it is in a favorable condition, if you have a good season, you can make a pretty good tree out of that the second year. If you cut it back, it does not seem to get as strong a root.

Mr. Wedge: Would you recommend that as a common practice or not?

Mr. Nordeen: I would not, because there are some winters when the weather is so cold and the ground freezes so hard that it disturbs those roots so that some of them are injured. I would not recommend cutting back the trees.

Mr. G. J. Kellogg (Wisconsin): If it injured the stock, would it injure the tree?

Mr. Nordeen: Not so much.

Mr. Philips: How would it do to wait until spring to cut it?

Mr. Nordeen: We never practice that.

Mr. Wedge: You do not think there is much advantage in cutting back?

Mr. Nordeen: No, not in this state.

Mr. Philips: Don't you think with the Hibernial and Longfield it is of advantage to cut back to have them grow straight?

Mr. Nordeen: That may be true of those varieties; it may be of advantage to them.

Mr. Harris: Don't you think if you gave those Hibernial a long graft it would save their cutting off?

Mr. Nordeen: We tried that one year. I made fifty grafts of the whole root, and selected some good roots and made fifty piece grafts, and we could not see any difference in them at all. In the fall I examined them both, and the piece roots had thrown out a nice system of roots, while the whole root had thrown out a weak root.

Mr. Philips: Mr. Pearce said the tap root was the only root to grow the tree from.

Mr. Nordeen: I can't see any difference. We make sometimes three grafts from one root. We never see any difference. I don't think anybody can.

Mr. Kellogg, (Wisconsin:) When you say the whole root, what do you mean?

Mr. Nordeen: It is the *whole root*.

Mr. Harris: I think the crown graft makes the better piece.

Mr. Kellogg: Well, now, I know it don't. (Laughter). One year I tried it with the Northwestern Greening; I took the first section and three or four cuts, sufficient to try them. The fourth cuts did not come as well, but in the rest no one could tell the difference.

Mr. Harris: Did they have as good feeding roots?

Mr. Kellogg: Yes, sir.

Mr. Dartt: I once grafted fifty of the ground grafts and fifty second cuts. I grafted them alike and set them, and they grew about the same; I could not see any appreciable difference in favor of the ground graft; the second cut was just as good as the first cut.

Mr. Nordeen: I think I know where Mr. Harris gets the idea of the first cut being the best one. It is the thickest portion of the root, and if I can put on a good sized scion it may make a larger growth the first season than the second cut would make, but at the end of the second season you could see no difference.

President Underwood: If you were setting grafts by the thousand, two, three hundred thousand, and putting a good deal of money in it too, you would see which was the most practicable. We have set them in large quantities, not fifty, but probably ten, fifteen or twenty thousand of short scions on long roots and long scions on short roots and tested them, and there is no appreciable difference. The short pieces will grow just as good trees as the long roots. A short root is just as good as a long one.

Mr. Wedge: Could we not take a show of hands as to those who are in favor of the whole root and those in favor of piece root trees?

Mr. Kellogg: I don't see that that would do any good. Every one would do as he pleased anyway.

Mr. Wedge: This is only to get the sentiment of those present who are interested in apple growing. I would like to see a show of hands as to what they prefer for our climate.

President Underwood: Mr. Wedge's idea is this: There are certain nurserymen in the South who make a great advertising feature of the whole root and say that no trees grown on piece roots are worth setting out, and the idea is to find out whether you must have trees grafted on whole roots or piece roots.

Mr. C. L. Smith: We had a report from Prof. Green and Mr. Wedge of their visit to the orchards of the state, and I was interested in two items of that report. One was in regard to some trees belonging to Sidney Corp that were thirty years old; and we had a paper by Mr. Bullis that mentioned a Talman Sweet twenty-eight years old. Those trees are in good bearing today, and they were grafted on little pieces of roots less than two inches long. I know that because I did the work myself.

Mr. Wedge: I want to say in addition to what the president has said, that in our section of the country thousands of trees are sold, and they make that the general feature.

A vote being taken, the members present declared themselves unanimously in favor of trees grafted on piece roots.

Mr. Wedge: I want the reporter to get that down straight, that this society was unanimously in favor of piece root grafted trees.

A REMEDY FOR GRUBS, CUT WORMS, ETC.—There have been so many complaints of damage done by these pests during the past season that the experience I have had with them may be of service. Some years since I cut some flower beds in a lawn, which I planted with coleus and achyranthes, that started to grow finely for a month, when I noticed some began to flag. Upon examination I found them eaten nearly through and at the root by large grubs. I tried several "sure cures" but without success. At last a friend recommended me to try a good coating of oyster shell lime. The plants were all taken up, and a thorough dressing forked in. The plants were reset, and in a very short time they made a splendid growth. In fact, the beds in which the lime was used far surpassed all the rest in growth and coloring, and when I mention the fact that I had 20,000 plants in beds and borders, it was a very good test.

I have used oyster shell lime for pot plants, vegetable and, in fact, almost every crop, and have never seen a thing injured with grub or cut worm where it has been used. To my mind it is one of the best fertilizers one can use, and I have often wondered that it is not more generally manufactured and used. The shells can be had for the carting, and the cost of building a kiln is comparatively trifling.—*The Florists Exchange.*

PEACHES.

O. M. LORD, MINNESOTA CITY.

In the spring of 1853, I wanted to plant some fruit trees where I now live. I had occasion to go to Galena and visited the fruit farm of Mr. Soulard, a very genial and intelligent man. He advised me to try apple, cherry, pear and plum trees, "but," said he, "peach trees will not live up there. Whenever the mercury falls to 14° or 15° below zero Fah., they will be killed."

Remembering his advice, I considered it useless to try, as we are liable to much more severe cold. However, peach seed was frequently planted in this vicinity, and sometimes the trees made a fine growth, to be killed back every winter, and, of course, no fruit. The first one to meet with success, I believe, was Mr. P. M. Gideon, and his method has been published and illustrated till it is generally known to all who care to inquire.

In the spring of 1884, the Jewell Nursery Company sent me two Hale's Early peach trees, which I set out, and both grew but winter killed. In cutting back I saved some scions and crown-grafted into plum roots. These grew readily and finely, and the third year blossomed and produced some fruit. These trees were accidentally killed.

The next venture was with one dozen trees from Savannah, Mo., Hale's Early, Old Mixon and Waterloo. Mr. Frazee furnished me with a description of his method, which was to place a board or flat stone under the roots and place the roots in such a shape as to make them grow over one edge of the board, so that by removing some of the dirt the trees could be bent over and covered for the winter. I did as directed but covered the trees with dirt and killed them, as they never exhibited any signs of life. Had I protected the roots with dirt and tops with straw or hay, I presume they would have lived, as since then I have sometimes thrown a little dirt on the tops of the trees, which it invariably kills wherever it comes in immediate contact. Attempts have been made in this vicinity to protect the trees by binding with straw or hay or by placing cornstalks about them, but without much success. As I knew but little about peach culture except by reading, I was under the impression that our seasons were not long enough for them to ripen. I therefore wrote Mr. Kerr, of Denton, Maryland, to send me a few trees of the earliest peaches. He sent three varieties one year from the bud, Early Rivers, John Haas and Elberta. The third year after setting, they bore finely, though we were visited by some frosts late in May. The Early Rivers were ripe the first week in August, the John Haas about the middle of August and the Elberta the first week in September. These trees were planted rather deeply on a sandy soil, with care to place the longer roots lengthwise of the row with the intention of bending them over crosswise to cover for the winter.

In setting trees in the future, I would set further apart in the row and place the longer roots crosswise, so as to bend the trees lengthwise of the row. To lay them down, I first put sufficient straw in a small pile to keep the tops from the ground, and dig down beside the stem, cutting any roots that may be in the way, and, if necessary,

taking a little dirt from under the longer roots, bend the tree toward the hole. Some will be laid down easily and others quite hard, depending on the shape of the roots which are in the ground. It is not necessary to lay them flat, but only so far as to be easily covered with straw or refuse hay, which must also be fastened so as not blow off.

I would not try to set them up in the spring till frost is out of the ground and the weather settled. Take off all the covering, remove some of the dirt near the roots and set up stright and pack the earth firmly around the roots. A rigid cutting back is now necessary; take off from one-half to two-thirds of the last year's growth and any large limbs that are not wanted. It is desirable to keep the tree in rather a bushy form, as it is more easily handled and protected.

This ground has not been highly manured but was occupied with red raspberries for several years. The trees all appear to be healthy and remarkably vigorous, and while I do not care to discuss commercial peach growing in Minnesota, I shall plant enough to furnish an abundant supply for the family with as much confidence and assurance as I would plant blackberries, which are considered a sure crop here, though subject to the same conditions of winter care.

Mr. J. S. Harris: I think the gentleman is here who raised the peaches which are on exhibition. I would like to have him give us a history of how he raised them.

Mr. G. F. Flatin: I have prepared no paper on the subject, but I will try to answer any question that I can.

Mr. G. J. Kellogg, (Wisconsin): How do you plant?

Mr. Flatin: The plants were all raised here; they were raised from the seed.

Mr. C. Wedge: How old are your trees?

Mr. Flatin: Seven years old.

Mr. Wedge: When did they come into bearing?

Mr. Flatin: They were four years old when they came into bearing.

Mr. M. C. Bunnell: What kind of peaches are they?

Mr. Flatin: Those I got the seed from were Michigan peaches.

Mr. Wedge: How do you protect them?

Mr. Flatin: I lay them down in the winter.

Mr. A. H. Brackett: How many peaches did you raise?

Mr. Flatin: I raised about five bushels this year.

Mr. Brackett: On how many trees was that?

Mr. Flatin: On six trees.

Mr. Kellogg: How do you lay them down?

Mr. Flatin: I lay them down the same way this paper told you.

Mr. F. W. Kimball: What do you cover them with?

Mr. Flatin: I put straw over.

Mr. Brackett: Do you cover them all over with straw?

Mr. Flatin: I don't suppose so much would be necessary, but too little might do them harm.

Mr. Brackett: Are those six trees all of the variety of which you show those samples?

Mr. Flatin: I have two yellow varieties and two red ones.

Pres. Underwood: Do the tops take any harm during the winter?

Mr. Flatin: No, they are kept off the ground.

Mrs. J. W. Ray: How tall are the trees?

Mr. Flatin: About twelve to fifteen feet high.

Mrs. Ray: Do you lay straw on the tree?

Mr. Flatin: A little.

Mr. Harris: What time in the spring do you take them up?

Mr. Flatin: In April sometime.

Mr. Harris: Were they covered during the freeze in the spring?

Mr. Flatin: They did not freeze. The frost did not hurt my peaches.

Mr. Harris: I think you told me the peaches were quite a little size when the frost came.

Mr. Flatin: Yes.

Mr. Kimball: You are on a high elevation?

Mr. Flatin: Yes, about the highest elevation in Houston county; I don't know how high it is.

Pres. Underwood: Is it level ground?

Mr. Flatin: Yes, nearly level ground; on a north slope.

Mr. Brackett: If a person can raise five bushels on six trees, I don't see why peach culture would not pay.

Mr. Bunnell: I understand these peaches are raised near Spring Grove?

Mr. Flatin: About one and a half miles from Spring Grove.

Mr. Bunnell: What is the nature of the country?

Mr. Flatin: It is rolling prairie.

Mrs. Stager: Do they always get ripe?

Mr. Flatin: I never had any trouble; they always get ripe. They got ripe last year.

Mr. Harris: Some of those peaches are not as large as last year?

Mr. Flatin: I guess there were too many on the trees. I did not thin them out.

Mr. Harris: Some of those peaches he raised measured nine inches in circumference.

Mr. Flatin: These I have on exhibition here are not as large as when I shipped them here.

Mr. Harris: Do you think peaches can be grown so the culture could be made profitable?

Mr. Flatin: Yes, I guess they could, if straw was cheap enough.

Mr. Brackett: How many hundred weight would it take to cover those six trees?

Mr. Flatin: Usually all I can put on the hayrack.

Mr. Busse: Did you ever try covering with leaves?

Mr. Flatin: No, I never tried it.

Mr. Pearce: Peaches! peaches! There is no fruit that grows that I am so carried away with as peaches.

Mr. Philips, (Wisconsin): How many did you raise this year?

Mr. Pearce: I had thirty trees, and they were just loaded with fruit. There came that terrible hard frost, and as a matter of course I thought the peaches were all gone, and yet some of the trees had thirty, forty to a hundred on, with all that freezing. I think I would have had thirty bushels if it had not been for that freeze. Now, peach trees will stand much more cold than you have any idea of. The idea is to get them down before the ground freezes, and let them remain in that position, let this ground freeze, and then it is the easiest matter in the world to throw a little marsh hay over them. A ton of hay will cover fifty trees. We just threw a light covering of hay over those peach trees, and it was just as good a thing as we could do. On the strength of it I bought 150 trees, and I have also planted a lot of peach pits and plum pits, and I have been more than well pleased with my success.

Mr. Brackett: How much fruit did you get last year?

Mr. Pearce: I got a good deal of fruit. I have taken every precaution to protect the fruit trees.

Mr. Kellogg, (Wisconsin): How tall are your trees?

Mr. Pearce: Some eight to ten feet high.

Mrs. J. Stager: I live in a colder part of the country. We have had peaches year after year in St. Cloud. This lady who is here with me has had some of my peaches. I bought Canadian Iron Clad, and that tree lived sixteen years and for nine years was almost every season loaded with peaches. I planted it as any greenhorn would, setting it up straight instead of

slanting. I laid it down with a board over it, and had to take a 2x12 to lay it down with; I had to bend it over slowly and then work it down with chains, and I kept it covered with straw.

Mrs. A. A. Kennedy: One of our neighbors had a peach tree growing eight to ten feet high, and they wrapped it with straw and bound it round with blankets, but last winter it froze to death.

Mrs. J. Stager: I thought they needed a little air?

GROWING STRAWBERRIES WITHOUT IRRIGATION.

M. PEARCE, CHOWEN.

Those who have been engaged in agriculture or horticulture in Minnesota during the past thirty-five or forty years know all about the climate, its long and cold winters, and short, hot and dry summers. Cold and drouth are two great obstacles in the way of fruit growing, both of which can be bridged over to some extent by covering, mulching and irrigation. Irrigation is of two kinds, one by direct application of water, the other to plant intelligently and by proper cultivation draw moisture from below.

In the brief paper that follows, we shall confine ourselves to growing the strawberry without the application of water. Close observation of your own work and that of your neighbors who are in the same line of business is of the utmost importance to all progressive fruit growing. Watch the results where different treatment has been given. It is often the case that where one fails another will make a great success by correcting a few errors. A failure, in the place of discouragement, should be a means of future success. We are in the habit of inviting progressive fruit growers to visit our grounds in September. Those gatherings are of unusual interest, and each one returns home with new ideas to put in practice. We also make it a special business to visit the fruit farms in our neighborhood at the close of the growing season. At that time a correct conclusion can be arrived at what the future crop will be. When we visit a plantation at the stated time and find the plants well grown, heavily rooted and evenly distributed over the ground and not hilled up, we say in our mind, "If the season is favorable, here will be a heavy crop of fine strawberries, and even if the season is very dry there will still be a good paying crop. A failure will be almost impossible." The reverse of this, if the runners are thick, small and matted together, leaves and plants small, poorly rooted or matted rows badly hilled up. Our verdict in a case like this is, "little fruit and that inferior, let the season be the best." So much from observation, from which we draw valuable information. On our own ground, we are using our best judgment and that of others in preparing the ground, setting out the plants, their cultivation and mulching, that we may be able to avoid the heavy losses in time, labor and money which have greatly discouraged strawberry growing for years in the North-

west. Of this we are fully persuaded, it takes the whole of the season to grow good fruiting plants; there must be no delay in rooting as soon as the plants are in condition.

We commence preparing for strawberries by plowing the ground deep in the fall, harrowing level and planting it to potatoes in the spring, giving them the best of cultivation. Allow nothing to seed on the ground. At digging time, leave all the small potatoes on the ground. Give the ground a good dressing of well rotted compost, composed of horse, cow and hog manure. Plow potatoes and compost under deep, harrow till the soil is fine and level and go over it again in spring with a heavy harrow with long, sharp teeth, cut the soil fine and deep and smooth it over with a light harrow. Plant about the 15th of May or as soon as the ground is warm in rows four feet apart, plants from twenty inches to two feet apart in the row, every third row a staminate variety. Stretch a strong line on one side of the ground the long way; stretch the line until it is perfectly straight. At intervals of forty or fifty feet along the line place a small stone or some weight on the line to keep it in place.

Use good plants from new beds; dig, trim and tie in bunches of fifty; puddle the roots of each bunch in a mixture of clay and water about the thickness of paint; heel the roots of the bunches in moist ground, each variety by itself, marked with a stake with the name of the kind.

We plant in the following way: Use a sharp and bright spade; place the edge near the line and press it down perpendicular six or seven inches, work it back and forth two or three times and then draw it out. In this way the holes are all made to receive the roots. Another person sets the plants in the following way: He takes a plant in his left hand, spreads the roots like a flat broom and places them in the hole, presses the soil about the lower parts of the roots and then fills up to the crown and presses the soil lightly with both hands.

When our plants are set out they are all in little holes about five or six inches in diameter and an inch and a half deep, and the crown of each plant is an inch and a half below the surface soil. In this way two persons should set out at least 6,000 plants in a day and do it good.

As soon as the plants make a good start, in place of cultivating and hoeing, as is the usual custom, we draw with hoes an inch and a half of soil from between the plants in the rows to the center of the space between the rows. This leaves the soil between the rows in the center three inches higher than it is in the rows of plants. Cultivating with a horse commences soon after the soil has been drawn between the rows, and is continued with about ten days between each cultivation, going each time the same way. The plants being straight in the rows, the cultivator is run close to the plants, and but little hoeing is required. But one tool with a horse is used the first season, and that is a small iron cultivator in the shape of the letter V; it opens and shuts with the aid of a thumb screw. On the end of each tooth is a very small steel shovel. This cultivator cuts the soil fine, loosens it below and does not hill up the plants.

When the plants throw out runners a foot or fifteen inches long, they are all placed by hand properly in the rows with a little soil on each runner where it is to root. In this way the plants are all rooted and make a vigorous growth regardless of drouth, the best of plants for fruiting another year.

We go twice over the plants to arrange them for rooting. After that, if fruit is the prime object, all late runners and plants should be destroyed; they are worse than weeds, parasites to the mother plants. Mulching should be done the last of October with marsh hay, litter from the stable or wheat straw. To keep the mulch from blowing off, we place a telegraph wire on top of the mulch, each end attached to a stake at the ends of each row, with weights on the wires at intervals of forty or fifty feet. The same wires we use to hold up our raspberry canes when fruiting. If we did not have them, we would use something else to hold the mulch. It is an excellent plan to remove the mulch in the spring and cultivate between the rows and then return sufficient mulch to protect the fruit from the ground.

In writing this paper I have gone more into detail than usual. To put all those details in practice takes time and labor, but no more than it does in the usual way. The plants are straight in the rows, and the cultivator does the work of ten men. Our experiments in growing plants for fruiting, as we have stated, have never failed to grow a paying crop of good fruit the driest seasons we have had. We practice what we write and expect a good crop of fine fruit another year without the application of water, regardless of drouth.

Mr. G. J. Kellogg, (Wisconsin): I would like to ask Mr. Pearce what variety escaped the rust and blight with him the most successfully.

Mr. Pearce: I am not troubled a great deal with that. In the first place, I try to keep the blight away, I do not think I had any blight last year. I always grow my own plants. If you destroy all the spores that produce the blight on your plants, with proper care it is just as easy to grow strawberries without blight as with it. Blight is a fungus that is propagated by spores or seeds the same as weeds. I do all my work before the plants are set out. Now there are some varieties that are more liable to blight and rust than others. You find the Crescent free, the Warfield quite free, the Greenfield quite free. Then there are other varieties that are quite apt to blight. The Wilson blights on my soil, so does the Capt. Jack, and the Downing blights very badly. The blight has been the least of my troubles and will be the least of anybody's trouble if the proper precaution is taken in growing the plants. I would not take plants from an old bed unless I wanted to get a start, and then I would spray the new plants right along with Paris green. I grow pure plants free from disease, and you can do

it. There is no earthly use in having a bit of that in the country. It is a parasite, and the parasite produces the seed, the same as the seed produces the weed.

Mr. M. C. Bunnell: Do you think every third row is sufficient to plant for fertilization?

Mr. Pearce: Yes, I think so.

Pres. Underwood: Here is a question: "What is the best way to keep berries overnight if they cannot be shipped until the next day?"

Mr. Pearce: We often keep ours overnight by putting them where there is a free circulation of air.

Mr. G. J. Kellogg, (Wisconsin): If you find it necessary to keep them overnight, put them in a dry cellar. The best way to keep them is to get them off in time for supper.

Mr. A. J. Coe, (Wisconsin): If you put them in a cool cellar and then bring them out in the warm air, they will sweat and spoil.

Pres. Underwood: We have often left crates of berries in the grass under the rows of grape vines or in the raspberry bushes, and they would keep in perfect condition. I should think it would be a good idea to have a room for fruit, have it open so as to get a good circulation of air right through the room, then set the boxes out so that the air could circulate around them, and I should think in that way you could keep the fruit as well as in a cellar. They have fruit rooms like those at Sparta.

Question: "What is the best time to cover the plants?"

Mr. Kellogg, (Wisconsin): The best time I should say was as soon as we have heavy frosts, not early frosts.

Mr. Coe, (Wisconsin): Our practice has been not to cover until the ground would stand it to drive on, say one load in the morning before the ground thaws.

Mr. A. F. Collman, (Iowa): I agree with Mr. Coe; that is our practice.

Mr. C. Wedge: I think an earlier slight cover would be an advantage.

Mr. Pearce: I think the best time to cover them is before a hard freeze comes in the fall; cover them a little thin to protect them from freezing and thawing. A freeze and a thaw will injure them more than freezing will. I always cover about the last of October.

Mr. O. M. Lord: Last year the frost was so severe every night before the ground froze that I was alarmed about my plantation. I found they were being injured by the severe

frost, and I had a mixed crop. This year I waited until last week—I have covered them now.

Mr. Dewain Cook: I have not had a great deal experience with strawberries, but the last two years I have covered them, waiting until the ground was frozen. This year I covered mine the last of October one and one-half inches deep. I looked after them just before I left home, and they are in fine condition.

President Underwood: I have plowed the first day of January in Minnesota, and I think to say that you must not cover berries until the ground is frozen is not safe advice.

Mr. Harrison: I have had considerable experience in covering strawberries in Dakota. I have had more trouble in covering too early than too late. My friend's idea here is very good; commence to cover lightly and then increase.

Mr. Lord: If the ground freezes at night and thaws during the day, I think it injures my vines a great deal more than it does to have them freeze solid and stay frozen.

President Underwood: No one likes to cover before freezing. It is the alternate freezing and thawing that hurts the strawberries. I would rather have them covered. You must be governed by your location; the same rule in all cases might not work so well.

Mr. Lord: I would have liked to have covered my plantation earlier this fall, but it was located on a side hill, and I preferred to let them take their chances.

Mr. C. L. Smith: What these men have said here just exactly corroborates what I said yesterday. You put on mulching sufficient for the winter at that early season, and you are liable to smother your plants, so from what they said here I am sure I am on the right track. Put on a light mulching first, and then wait until November and put on more mulching for the winter.

Mr. Pearce: I tried mulching of different kinds. I think threshed bean straw makes the finest kind of a mulch. I raise some beans every year just for the purpose of using the straw as a mulch. It makes the finest kind of mulching. I find somehow or other it is the best thing I ever tried, and my berries are all in good shape.

Mr. Bunnell: I would like to know if begasse is not a good thing? A man down in Worthington county is going to try that.

Dr. Frisselle: I think one of the best things to cover strawberries with are cornstalks laid along the length of the row. They are heavy enough so as to afford protection; they gather

the snow and make a very good protection. I do not know but what good begasse would lie down more closely.

Mr. Harris: It is a great deal better to cut those cornstalks in pieces an inch long than to put them on the full length of the stalks. My son cuts up his fodder for the cows, and what the cows will not eat he uses for mulch.

Mr. Collman, (Iowa): All the strawberries I ever covered were covered with cornstalks. It is very quickly put on and very quickly taken off in the spring. We do not have much hay to put on, and corn fodder is much cheaper.

Dr. Frisselle: There is one other material that has been used for years in the East, and that is tanbark. I know a man who used it. He put it on plentifully between the rows, and it was clean in the rows, and he had a most magnificent crop; I never saw a more magnificent crop.

Secretary Latham: For several years I covered my strawberries in the fall with cornstalks. It is not much trouble to lay them along in the row, just enough to partially hide the vines, and in the spring you do not have to take them off. By the time the crop is gathered, they are rotted and out of the way. There is no foul seed connected with the use of them, and they seem to be a sufficient mulch for the purpose. They can be put on early in the season, and they afford the necessary protection against severe frost in the fall. I do not know whether it would be practicable on a large scale.

IMPROVING STRAWBERRY VARIETIES BY SELECTION.

While the following will apply to fruits of all kinds, it is specially effective with the strawberry. There is no other fruit so susceptible to improvement and none so variable and liable to run down under neglect.

To improve them one should follow the course pursued by successful breeders of fine stock and poultry—breed up by selecting the most perfect individuals to raise from. Just before the berries ripen, go yourself over the best rows of each variety and carefully select young plants conspicuous for vigor, earliness (if earliness is of value to you), productiveness with general excellence and symmetry of fruit. Pull all fruit and blooms from those plants at once. Then with a garden trowel remove as large a clod as practicable, containing the plant and set in rich soil well prepared, each variety separate, of course. From these well cultivated, raise plants to set your young fields the coming year; and from the fields thus set, again likewise select the best, and so on forever.

The good effects of this plan will soon be manifest. It cannot change bad varieties into good ones; but it will surely make good varieties better. Having tested it for years, I can speak from experience. When it is not practicable to remove the selected plants, they can be marked with stakes and left in the fields; but great care will be required to keep the young plants from running among and mixing with others.—*The Western Garden*.

SPRAYING FOR APPLE SCAB.

(Extract from Oct., '95, Bulletin of Del. Agr. Experiment Station.)

After giving in detail the process and results of certain experiments to overcome the apple scab on the place of S. H. Derby, Woodside, Del., Prof. F. D. Chester summarizes the results and gives directions as follows:

RESULTS OF SPRAYING APPLE TREES—UPON THEIR GENERAL CONDITION.

A notable effect of the season's work was the protection which the spraying offered against diseases of the wood and foliage.

The general condition of sprayed trees was better than that of the unsprayed both as to vigor of growth and density of foliage. This favorable condition also persisted later into the season. On October 18th, I found that those apple trees which had received but a single spraying were entirely defoliated, while those treated four and five times were still clothed with leaves. A further good effect was noted in the general condition of the buds on the sprayed trees, seen on October 18th. On the sprayed trees the buds were markedly larger and more vigorous.

On October 4th, Mr. Derby wrote, "The indications are for complete success for the spraying for scab, and, further, the condition of the trees as to next year's fruit buds and 'staying on' of the leaves makes the experiment satisfactory to me, the russetting of the fruit, undoubtedly from the action of the spray, being the only drawback."

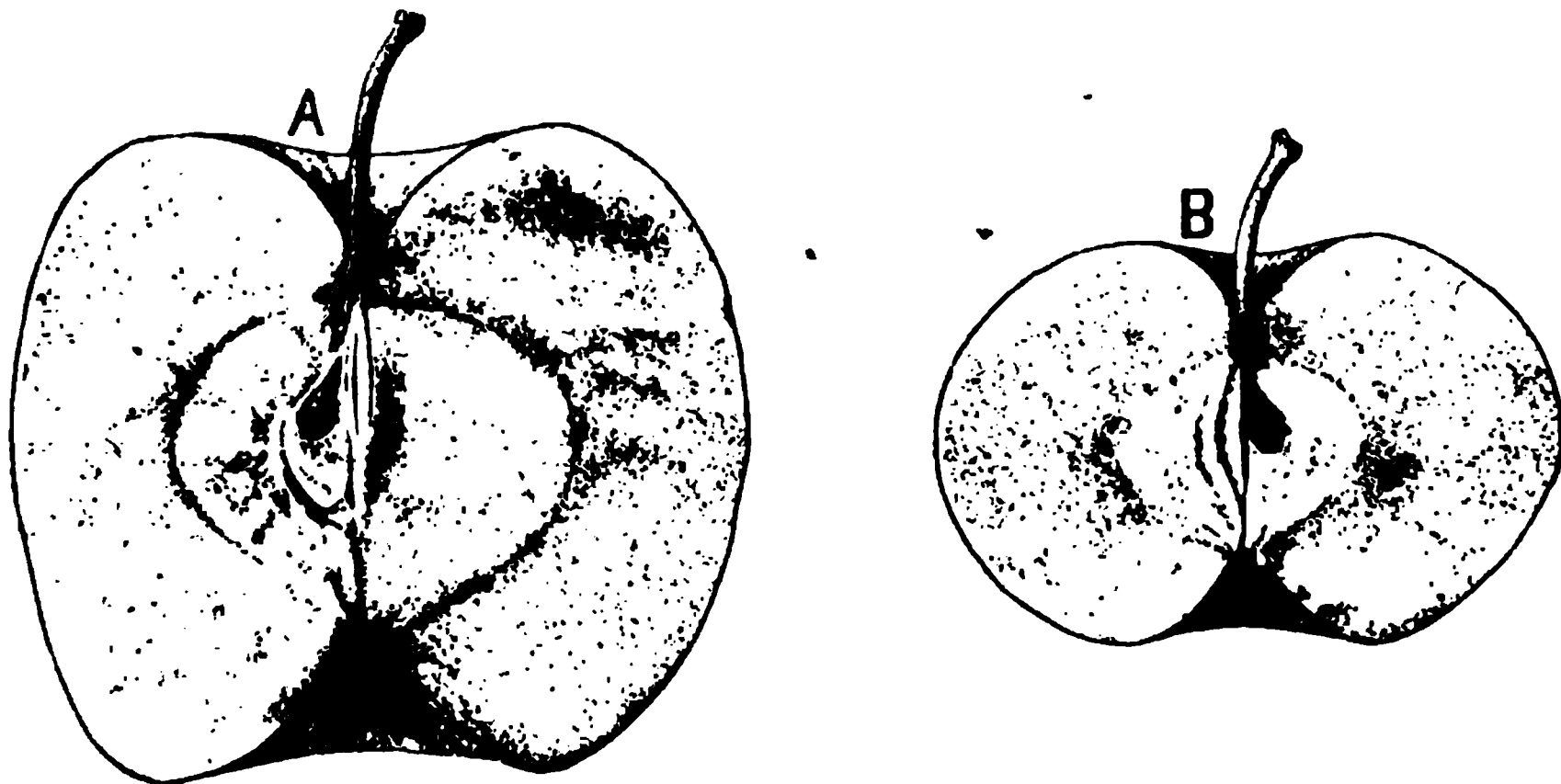


FIG 1—A shows a hypothetical Strawberry apple free of scab.
B shows the relative size of a badly scabbed apple of the same variety

GENERAL DIRECTIONS FOR SPRAYING APPLES.

Regarding the cost of spraying apples, Mr. Derby has estimated it for material and labor at about ten cents per tree for five sprayings.

In spraying apples we would recommend the course pursued by Mr. Derby in this experiment. Use the Bordeaux mixture, ($\frac{1}{2}$ D) made up as follows:

Copper Sulphate.....	6 lbs.
Lime.....	9 lbs.
London purple.....	4 ozs.
Water.....	45 gals. (1 bbl.)

For the first application, which should be made as soon as the buds begin to swell, London purple need not be added to the Bordeaux mixture, but for the second, third and fourth application it should be included. The second application is to be made just before the bloom opens, the third when the petals are nearly all shed, the fourth when the fruit is about the size of peas and the fifth about two weeks later.

The profitableness of spraying apples, so far as the control of the scab is concerned, will depend upon the susceptibility of the variety and the likelihood of the appearance of the disease without treatment. Trees affected as little as either the Early Harvest or the Wine Sap would hardly pay the cost of spraying, so far as this one disease goes.

But upon general principles we firmly believe that it will pay to spray all apple trees with a combined fungicide and insecticide, inasmuch as there are other foes than the scab fungus to be combatted by the treatment. Of these we have the various fruit rots, leaf blight and that very formidable enemy, the codling moth.

Furthermore, there is reason to believe that the general health of the tree will be so greatly improved that this alone will make the spraying of apple orchards a profitable expenditure.

RUST VS. FROST ON STRAWBERRIES.

President Underwood: I will say that Mr. West has received a sample of his strawberry vines he spoke about on Tuesday as being afflicted with rust. I asked him more particularly as to the condition of the vines. I see nothing like rust on those vines. It is not what I call rust at our place. He says it did not appear until after the first heavy frost came, and then they began to turn brown. I think they were in good condition when the first heavy frost came, and the alternate freezing and thawing produced the appearance he calls rust.

Mr. C. F. Gardner, (Iowa): I would like to say that my vines after some of those severe freezes looked as though they were struck with rust, and I made a close examination of them, but I could not find a particle of rust. It was caused altogether by the frost. There was no rust on those vines, and I know there was not on ours. Still a little ways off it looks just like rust.

Mr. G. J. Kellogg, (Wisconsin): I should say there was no rust on those plants. It may be a little hard to distinguish except on close examination, but I think the appearance of those vines was caused entirely by frost.

Mr. C. L. Smith: That again corroborates what I said the other day, that it is beneficial to give your strawberries a light covering early in the fall before they are subjected to any severe frosts.

IRRIGATION WITH RESERVOIR.

GEO. H. WHITING, YANKTON, S. D.

Mr. President and Members of the Minn. Horticultural Society:

It is at the earnest solicitation of your secretary that I undertake to give you in a crude state a few thoughts on my experience with irrigation; "Irrigation with Reservoir" your worthy secretary has been pleased to name it on the program.

Now, I shall not perhaps confine myself very closely to the latter part of the title, because a great portion of my irrigation has not been from my reservoir but direct from the well.

My artesian well, which is a three inch one with a flow of about 400 gallons of water per minute, gives one man all of the water he can conveniently handle as it flows from the well. Thus far, I have only tried to cover from thirty to forty acres and have had a sufficient amount of water to do it without the necessity of storing it in advance of the time it was wanted for use.

Now, just a few words in regard to my manner of distributing the water. My grounds are laid off in blocks, making the rows from twenty to thirty rods long, and I run the main ditch across the upper ends of the rows that it may be tapped at any point desired. My method is to begin at one side of the plat (usually the side nearest where the water is coming from), taking the water out of the ditch by removing a few shovelfuls of earth from the side of the bank and placing the same across the channel, and turn it into one or more rows, allowing it to move along down the cultivator marks until the lower end is reached and the ground is well soaked. Right here allow me to state that land with just a sufficient incline to make the water run is preferable to land with a greater slope where the water runs over it rapidly, causing it to wash more or less and not giving it time to soak well into the soil.

The water from my well has a temperature of sixty-three degrees, making it warm enough for irrigation just as it flows from the well without taking the time to warm it in a reservoir.

Returning to the subject of reservoirs, I find that they have many advantages, especially so in cases where the water supply is limited as regards the amount of land to be covered. In fact, they are an absolute necessity in a majority of instances, especially where the water does not run continuously or where it is necessary to save it for a dry time between showers. In my case, I have not yet been troubled about storing water in advance.

My reservoir is comparatively a small one, being approximately round with a diameter of about one hundred feet and a depth of about four feet. As my demands for water increase, I expect, of course, to increase my reservoir capacity.

With two years experience with irrigation in the growing of nursery stock, fruit and vegetables, the writer is thoroughly convinced that it *pays* to irrigate where practicable, and that Minnesota fruit growers and gardeners should give more attention to irrigation. It is the *only* sure method; that is, it is comparatively

so, as the periods of drought more surely cut off a portion of the crop on an average than all other causes combined.

Water is absolutely necessary to the growth and development of vegetation, and it is becoming more and more apparent to intelligent cultivators of the soil, from the Pacific to the Atlantic, that the natural rainfall is too uncertain to be depended upon, especially with crops where a large amount of time and money are necessarily expended

VIEW OF RESERVOIR IN USE ON MR. GEO. H. WHITING'S PLACE.

upon a small piece of land. In the case of small fruits, where a drought of even short duration may rob the grower of perhaps one-half or more of his crop for the entire year, it is rather expensive, to say the least, to be without that supply of water to tide you over.

To those unacquainted with the facts, it will be a surprise to learn how much the tendency to winter-kill and the short life of Minnesota orchards is due to the lack of water; how many trees and plants actually starve to death during the long winters, because they had not sufficient water during the growing and maturing season to carry the food to them to be stored up for their winters subsistence.

I firmly believe that it behooves the fruit growers of the Northwest to give this subject more thought and more attention. Nearly every one can in some way obtain a water supply at some time of the year and store it up in a reservoir of some form or other so that it will be of great value when wanted.

Talk it over and try it; it will pay you.

Mr. Bunnell: In irrigating lawns from wells, what effect would it have? Would the grass look as green as if the water had been brought from a lake? A party at Newport had a lawn that would not color green. I do not know whether it was because the water was brought directly from the bottom of the well or not.

Mr. Richardson: In Winnebago City we have a dug well, and the water should be very cold in the summer. The water is applied directly on the lawns, and they are very green all summer.

Prof. Green: I have maintained a little lawn all summer by putting the water on directly from the well.

Mr. Kellogg, (Wisconsin): I would like to ask Prof. Green if it would pay to raise water seventy-five feet to irrigate a level prairie.

Prof. Green: I would like to have Mr. Hansen answer that question.

Mr. Hansen: I am very much interested in this matter of irrigation. I think a great deal of it, although I cannot get much use of it yet. You can never expect so much benefit the first year. I hope to think it is a good investment,

Mr. Brackett: How large is your reservoir?

Mr. Hansen: 60 x 100 feet, dug in the hill and clay puddled.

Mr. Wedge: How did you puddle it?

Mr. Hansen: I put in sufficient water so as to make it best to work, made a paste of it, then I put in my horses and kept them driving and backing until I thought it was very solid. I found it soaked considerable at first, but it kept getting closer and closer, and I have a good deal of faith in it now. I keep my ducks in there. I believe it is very tight now.

Mr. Wedge: How do you raise your water?

Mr. Hansen: I have a well put in 93 feet deep. I have a mill that pumps it right into the reservoir. It runs into the reservoir as it comes from the well.

Pres. Underwood: What kind of a mill have you?

Mr. Hansen: A St. Paul mill.

Pres. Underwood: How large is your well?

Mr. Hansen: Three inch cylinder.

Pres. Underwood: How large is the wheel?

Mr. Hansen: It is a 14-foot wheel.

Mr. Wedge: Would not a 12-foot wheel do?

Mr. Hansen: Well, it might do, but I want it big enough to draw all the water I want. I knew I would want a good deal of water.

Pres. Underwood: How large is the cylinder?

Mr. Hansen: It just fills a three inch pipe.

Pres. Underwood: It is a two inch cylinder and has a twelve inch stroke?

Mr. Hansen: It has a twelve inch stroke.

Pres. Underwood: What is the capacity of the pump?

Mr. Hansen: I never measured the capacity so I can say. Prof. Green was at my place and saw the pump; perhaps he can tell. I am sorry I was not at home.

Mr. Wedge: How long does it take to fill the reservoir?

Mr. Hansen: At first it soaked away considerably, but now as it gets closer I think it fills up about ten inches in 24 hours.

Mr. Wedge: Would it fill the reservoir in about a week?

Mr. Hansen: Well, I couldn't say about that.

Mr. Wedge: How large is the reservoir?

Mr. Hansen: 60x100 ft.

Pres. Underwood: Do you think it could be made of coarse sand with plenty of clay to puddle it?

Mr. Hansen: Well, I don't know. Mine is clay. I strew the sand on the bottom and then put my clay in. I have blue clay.

Mr. Brackett: Would it not freeze to the bottom?

Mr. Hansen: Well, it might if the water was left in.

Mr. Wedge: When it is emptied once and filled again does it leak?

Mr. Hansen: No, it does not leak. The ducks I keep in there help it a good deal.

Mr. Collman, (Iowa): I have one of those artificial ponds. I put thirteen teams at work and kept them at work for three weeks. The pond covers about one acre; it is from six to ten

feet deep. I dammed it up at the lower side, put down a dam sixty feet wide at the bottom; then I put an inch pipe under the bottom of the dam, and three feet below the lowest point of the basin, then I put a feeder in to furnish the stock with water. The water is always clear. We have not pumped a pail of water for our stock this summer. We had a little pond there before we made it larger, and my little boy went to the river and caught some of those little catfish and put in three or four. When we dug it out to make it deeper, we caught fish only two years old that measured eight or nine inches in length, and I think we caught something like a hundred. I am going to use this water for irrigation purposes. I can cover about three acres and I expect to irrigate. I expect to put that area out in small fruits and I want to carry the water by windmill and run it down between the rows. I think I can make it very profitable.

Mr. Kimball: How large a watershed have you to fill your pond?

Mr. Collman, (Iowa): About twenty acres. I have a large waste pipe to carry it off.

Mr. Brackett: Do you not lose considerable water by evaporation and seepage?

Mr. Collman, (Iowa): There was at first, but there is not a particle now. It will evaporate some, of course, but we always have plenty of water.

Pres. Underwood: While the discussion of this subject is of very great interest to all of us, we cannot neglect the business that must be transacted.

Sanvitalia is a very pretty annual of low, creeping habit and blooms continually throughout the summer and autumn. The flowers are double and of a bright, golden yellow color.

Many people are not aware that Dahlias from seed sown in the spring will bloom finely the first summer and give quite as good if not better satisfaction than bulbs. The seeds germinate in a few days and grow rapidly.

Lobelia Pumila Grandiflora is an exceedingly attractive variety of this old and popular flower. It blooms profusely, bearing flowers of pale azure blue, very large and double. White Gem is another annual of this class, with pure white single flowers. The plants only grow to a height of four or five inches and are densely covered with lovely white blossoms.

GREENHOUSE LABORATORY WORK AT THE SCHOOL OF AGRICULTURE.

PROF. S. B. GREEN, ST. ANTHONY PARK.

The illustration showing students at work budding roses in the greenhouses of the school of agriculture is given to call attention to a phase of horticultural instruction which we call greenhouse laboratory work—for it is laboratory work. It will be remembered by those familiar with the course of instruction at this school that its session is from October to April, which precludes doing such work as budding and grafting in the open air; so it is taught in the greenhouses. The boys of the A class bud roses and root-graft apples, and both buds and grafts are started at once into growth that the students may become familiar with the callousing process by which both buds and grafts unite, and they see the results of their labor. Roses are selected for practice, because they can be got into the right condition for working in January. Other lines of work followed are mixing of potting soils, potting of cuttings, repotting, making and rooting of cuttings, sowing of flower seeds, pricking out of seedlings, the destruction of insects injurious to house plants, testing farm and other seeds to determine per cent. of germination and quality and quantity of impurities and the crossing of plants.

For crossing plants we use the Chinese primrose, which readily crosses, has flowers large enough to be easily manipulated by students and is well adapted to illustrating the principles involved in such work.

The object of this instruction is not to make gardeners but to teach some of the more common things relating to plants, that the students may think of them as individuals instead of as fields of plants, and also to encourage a love for plants in and about the home.

SUBSOILING WITH DYNAMITE.

S. M. Emery, director of the Montana Experiment Station has resorted to the novel expedient of using dynamite to loosen the subsoil on a portion of a tract to be used for fruit setting. He describes the process as follows: "Two-inch holes were drilled to a depth of 4½ feet, in which were placed quarter-pound dynamite cartridges to which were attached sufficient lengths of fuse to admit of the safe discharge of the cartridges. The holes were filled with earth and thoroughly tamped. The explosion effected a complete mechanical disintegration of the soil for many feet in all directions from the hole. Two results will thus be attained—a porous, friable soil much sooner than would result from cultivation and an abundant moisture storage system."

We hope to report the practical results of the experiment later. Sec'y.

INTERIOR VIEW OF GREENHOUSE AT MINNESOTA STATE EXPERIMENT STATION.
PROF. S. B. GREEN'S CLASS IN HORTICULTURE GRAFTING ROSES.

NOTES FROM THE FARMERS' INSTITUTE.

CLARENCE WEDGE, HORTICULTURIST, FARMERS' INSTITUTE.

It was a very pleasant surprise to your institute worker to find the conditions in the pine regions of our state so favorable to our art. The better rainfall, moist soil and comparative freedom from withering southwest winds, together with exceptional market facilities, make it the best small fruit section of the state, and it may well be doubted if with proper selection of varieties we have a more favorable location for the larger fruits, especially plums and crabs. At Rush City, where we began our work after the holidays, we found in the audience a man who had brought with him for his noon lunch a pocket full of beautiful Walbridge apples. We had the pleasure of spending the night at his home and looking over his orchard. While his trees of the Walbridge were, as we had expected to find them, injured in the forks of the main branches, it was certainly very wonderful to see a variety that is scarcely hardy enough for central Iowa looking as well and bearing as well as it is fifty miles west of St. Paul. Single trees of his Transcendent crabs have borne an average of ten bushel per annum for some years past. Considerable blight is seen on the trees, but otherwise this variety is in good health, and the largest of seven old trees measured forty-five inches in circumference of trunk. His Early Strawberry, sixteen inches, fine and fruitful, was in perfect health, except blight; Maiden Blush crab, nearly perfect trees, twenty-two inches in girth; Wealthy and Haas, the latter twenty inches in girth, looking no better than Walbridge but fruitful and profitable; Russian sweet apple, name lost, is in excellent condition with little blight. Mr. M. Denning, the owner of this orchard, is by no means a careful or progressive horticulturist, and his varieties are all in a muddle. The orchard is not in what would be called a favorable slope, and the trees are in a matted sod, but the proximity to Rush lake and the rich retentive soil have doubtless combined to make it so good and profitable. Mr. Denning sold last season \$100 worth of Turner raspberries from one-sixteenth of an acre, and has also quite a number of promising plum trees.

At Aitkin, we found the first city in our travels in the woods that appeared to appreciate the value of the beautiful native pine and other trees. As a rule, the original forest trees are mercilessly cut down and those who care for shade, obliged to plant anew. At Brainerd, we found great interest in all fruits. We found fine crab trees growing in the city, and from the representations of those who attended the institute at Bay Lake they have an especially favorable location at that point. Robert Maghan, of the latter point, has one Transcendent crab that has borne as much as five bushels per annum. He is also growing some of the standard apples. D. Archibald, of Bay Lake, reports the Florence crab the hardiest and best tree he has tried and a very heavy bearer. He has picked in all as much as twelve bushels from his two trees of this variety. At Little Falls, we visited the orchard and fruit garden of a man who sells \$30 worth of plums and \$50 worth of crabs per year. We measured some fine apple trees but have lost the figures. He was

not attempting any special care or selection of varieties, but was proving very conclusively that even on the sandy soils of Little Falls it pays to plant fruit trees. We were greatly pleased to meet our old friend Mr. Cutler at the institute at Princeton, where he has recently settled down on a cozy farm a mile or two from the city. He has not lost his old love for the horticultural society and is arranging to use considerable of his land for fruit and will be heard from in the future.

There has been no point visited by the institute where some varieties of crabs or plums are not found to be flourishing, and our faith in the final success of horticulture in Minnesota is constantly growing.

GRAFTING.

J. S. HARRIS, LA CRESCENT.

Grafting is an art not nearly as well understood by the majority who plant fruit trees as its importance merits. It is an easy and sure method for changing a hardy tree that is unfruitful or produces worthless fruit into a fruitful tree, producing fruit of the first quality. It is also a most common method of propagating and increasing a new variety rapidly. There are a number of methods of performing the work, or styles of grafting. This paper will treat briefly only on the style or method termed "whip-grafting," as it applies to the propagation of nursery trees or making "root-grafts."

"Root-grafting" is generally understood to mean taking up young seedling trees by the roots and grafting them in-door during the winter. The best stocks are well grown one year old seedlings, having an average diameter of about one-fourth of an inch, that were taken up in the late autumn and have been buried in a cold cellar or other suitable place away from frost or drying. The scions used in this, as well as other kinds of grafting, are the growth of the last season, or the terminal shoots, and are best if cut before winter has set in and preserved in the same manner as the stocks. The stocks and scions being on hand, the only additional materials needed are a sharp, thin bladed knife and some waxed cloth, paper or cotton yarn—No. 18 being about the right strength. The best cloth is worn calico or muslin, which is cut into strips and made up into rolls or balls, care being taken to wind the strips smooth, or without folds. These rolls are to be put into melted grafting wax and soaked until they are thoroughly penetrated, and then laid on a board to drain and cool. Grafting paper is prepared by taking strong, thin manilla paper and with a brush spreading the melted wax thinly upon one side of each sheet, and afterward cutting it into strips convenient for using. The cotton yarn is prepared by dipping the ball into melted wax same as the cloth. Grafting wax is made by melting together over a slow fire eight parts of resin, four parts of beeswax and two to three parts of tallow, or about that proportion.

The stocks are prepared by washing them, cutting away the small fibrous roots and cutting them into suitable lengths. For what is termed whole root-grafting, the scion is inserted at the collar, or that

portion where the stem joins onto the root, and the bottom of the root is cut away five or six inches below. For piece root-grafting the seedling stock is cut into lengths three to four inches long, the graft always being placed on the upper end. The operation consists in

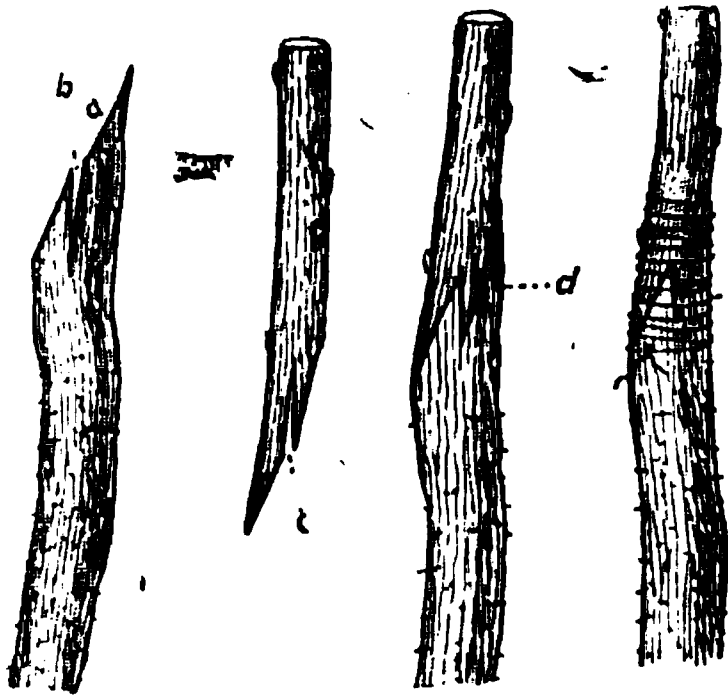


Fig. 3 Fig. 4 Fig. 5 - Fig. 6

taking the root and making a sloping cut upward like the mouthpiece to a whistle, an inch to an inch and a half long; then at the center cut a tongue downward (Fig. 3.) A scion about the same size and three to four inches long is cut in the same way, except that the slope is downward, and it also has a tongue cut from the center upward (Fig. 4.) The two are now fitted together with the tongues interlocking and pressed together firmly with the inner bark, at least on one side,

exactly joining, as in (Fig. 5.) The union being satisfactorily made, they are bound together by winding a piece of the waxed paper or cloth two or three times around, covering the junction closely—or binding them together with the waxed cotton yarn (Fig. 6.) The cloth or paper are most generally preferred to the yarn, as sometimes that does not rot and give way to the growth soon enough, often causing partial strangulation and dwarfing of the root.

These grafted stocks are then placed in boxes (each variety separately and correctly labeled) with sand or sandy earth among their roots and kept in a cool cellar until spring opens and the soil is in good condition for working, when they are usually set out in nursery rows that are about four feet apart, and for best results should stand sixteen to eighteen inches apart in the rows. They should be set deep enough so that the junction will be below the surface level, and usually but one bud of the scion is left above ground. Root-grafting may be done any time between December and May if the scions and stocks are kept dormant, but February is about the best time for doing it.

(To be continued in next No.)

When apples bring \$2.00 per bushel and wheat only about 50 cents, when the expense of taking care of an acre of apple orchard is no greater than that of an acre of wheat, while an apple orchard will yield ten bushels of apples to one bushel of wheat, it is about time fruit growers are opening their eyes and taking care of crops which pay the largest profit. What is true of apples may also be said of other varieties of fruits.

STARTING DAHLIAS.—Dahlia roots should be started in damp moss, sawdust or sand by covering and placing them in some warm situation, about one month before it is time to plant them out. By that time the eyes will be started; then cut the tubers so that there will be but a single eye to a piece. Should any more appear after planting out, remove them and never allow but a single stalk in one place.

Question Box.

"Which is the best form for planting strawberries to insure best pollenization?"

Prof. Green: I prefer to plant two rows pistillate and one row staminate.

Mr. Kellogg, (Wisconsin): If it is for the farmer and he wants a single row, I should alternate every other plant, plant a pistillate and then a perfect. If he can plant two rows, I should advise for the general farmer that he plant one row pistillate and one row perfect, and on the outside of those rows he would always have the proper plants for replanting. For the market I prefer two rows of perfect and four of pistillate. I believe we get better pollenization if we plant two rows perfect and four rows pistillate. For that reason I would plant two rows perfect and four rows pistillate.

"Will it pay a man having one thousand Duchess apple trees to provide cold storage to keep his apples? If so, what is the most practical course for him to pursue?"

Mr. Elliot: I am not competent to answer that question, I have not had experience with cold storage. It seems to me if I could not use the kind of cold storage they use here in the city I would provide myself with a quantity of ice and arrange a storage room for apples underneath, so the cold would come down from the ice above it. That would be my method.

Mr. Harris: I should think that kind of cold storage would pay if they would keep to be sold in the winter and spring, but I think the better way would be to have a man in the city put them in storage.

"Where is the best place to hold our meetings, in the city or in the country town?"

Pres. Underwood: The advisability has been discussed of holding our meetings at the agricultural school. These questions are asked to bring out an expression from the members as to what their preference would be or as to where the most good could be accomplished.

Mr. Philips, (Wisconsin): This is a good place.

Mr. Kellogg, (Wisconsin): Lake City is one of the best places I know of in the state.

Pres. Underwood: Of course, there is no reflection intended on any place, if there should be an expression in favor of any one place. This was simply to get an expression as to whether it would be advisable to hold our meetings in Minneapolis or St. Paul or go to some of the smaller towns, move around.

Mr. Kellogg, (Wisconsin): With us in Wisconsin we migrate from place to place. If we find an opportunity to go to a place that needs a horticultural stimulus we go there, and we have sometimes built up a good local society in that way. We have done it more in the summer meetings than in the winter meetings. In the winter we want a hall that will hold the people. We go to Madison, because we want to be near the legislature.

"Please tell us how to keep apple seed from fall to spring so it will grow?"

Mr. Lyman: Plant them in the fall.

Mr. Elliot: If any one does not wish to plant them in the fall, they can be put in moist soil and packed away in the cellar and then planted in the spring.

Prof. Hansen (S. D.): I would sooner pack them in moist soil in the fall and bury them outside just below the surface where they can freeze hard all winter long. If the snow piles up too much over them, shovel it away. If you get the seed in the spring, it is pretty well dried, and you have to soak it over night in water before you plant it.

"How much value is there in subsoiling?"

Pres. Underwood: We will ask Prof. Snyder to answer that question.

Prof. Snyder: I think that is a question on which we have hardly enough data to venture an opinion. If we have a stiff clay soil, we would derive benefit from subsoiling if we have enough rain. If we have a gravelly soil, I hardly think we gain anything by subsoiling, unless it be done for a special purpose.

Mr. Collman, (Iowa): I do not know that I know any more about this matter than any of you living here, but with us in southwestern Iowa we think there is nothing like subsoiling.

NOTICE--ARBOR DAY PLANTING.

PRIZES FOR THE BOYS AND GIRLS.

The membership fee of the Minnesota State Forestry Association is one dollar; the annual membership fee of the Minnesota State Horticultural Society (including the cloth bound report of 1895—500 pages—and their monthly magazine, THE MINNESOTA HORTICULTURIST) is one dollar; the nursery price of the number of plants in each lot designated is one dollar; but at the expense of the association, to encourage the planting of reliable trees, I make the following offer:

For \$1.60 I will send you an annual membership in the State Horticultural Society, including the report and magazine as described above, for the year 1896, and, post-paid, 25 evergreens, 4 to 8 inches, nursery grown, consisting of Scotch pines, white pines, arbor vitæ, white spruces; or 25 barberries; or 25 rooted hazlenuts; or 100 one-year green ash; or 100 box elders; or 100 soft maples, the plants to be mixed or separate as you may order. Also, for six cents to cover the postage, a copy of the 11th edition of the Tree Planter's Manual, containing a world of information on tree culture, and another able pamphlet just published, on "Water Disappearance in Minnesota," and one package of green ash seeds gathered last fall, containing over 500 seeds. The forestry literature and seeds will be mailed on reception of the order with the money, and the plants mailed in proper season. This makes you a life member of this association, entitled to all the issues of our future forestry literature and no after dues required.

Now for a grand Arbor Day rally of a full week of planting next April! Let us see what town or county will do the best! It is understood that you are to report success to me for record on the Roll of Honor. Send in your orders fast as possible.

Editors of other papers are requested to co-operate.

Address:

J. O. BARRETT,
Sec'y Minnesota State Forestry Association, Brown's Valley, Minn.

March Calendar.

J. S. HARRIS.

It is rarely ever that the spring is forward enough in this locality to plow or plant in the orchard and nursery in March, and should the frost come out it is hardly wise to plant trees so long before vegetation will start; the roots cannot supply the moisture that would be evaporated by freezing, thawing and drying winds.

Those who have neglected to place their orders for the needed supply of trees and plants should lose no time in doing so. We advise purchasing as near home as possible, for the reasons: first, the trees will generally be received in better condition; second, the cost of transportation will be very much less.

The orchard and nursery should be looked over at once. If any limbs have been broken by winds or accumulations of snow and ice, make a smooth wound and cover with grafting wax. Trees that are girdled with mice or rabbits, if well banked up with earth or the injured parts covered by the application of a thick plaster of fresh cow dung and loam, bound on by a coarse cloth, provided the inner bark is not destroyed all the way around, will generally recover. Where the girdling is complete, the trees can generally be saved by taking shoots of the same tree, sharpened at each end, and inserting them in a cut made with a chisel above and below the wound and covering the wound with clay or grafting wax.

Should the weather permit, grafting may be done about the last of the month. Plums and cherries should be grafted the earliest and before the buds begin to swell. Apple trees may be grafted throughout the next month. Root-grafting should be finished up as early as practical.

If it is necessary to do any spring pruning, it should be done before the sap and buds start, and it is in order to wash the trunks and large branches with lye and soft soap reduced to the consistency of thick paint. If a half ounce of carbolic acid is added to each bucketful of the wash, it will assist in killing the eggs of insects and the spores of fungi.

Blackberries and raspberries start early and should be planted early. Therefore, if the weather permits, the ground should be got ready so there will be no delay when the planting time arrives. It is in order now to haul and spread manure in the orchard.

In the vegetable garden it is useless to plant seeds in the open ground, but plants of cabbages, cauliflower, lettuce and tomatoes should be started in hotbeds, cold frames or window boxes, and spare time should be utilized in securing a plenty of manure and getting it ready to push business when the time for making garden is at hand.

Your Corner.

THE LOUDON RASPBERRY.—Mr. F. W. Loudon, of Janesville, Wis., the originator of the Loudon raspberry, in a letter dated February 18, 1896, gives the following succinct description of this new berry: "The Loudon originated fifteen years ago and showed its first fruit when two years old, and there has never been a failure since. The plant is perfectly hardy here and has never lost a bud by a hard winter. It is immense to yield. The berry is the largest ever sent out; so firm that it will ship over one thousand miles in good condition; quality, best; it does not crumble, never drops from the bush and will hang on the bushes ten or twelve days and look bright and fresh."

Some of our members visited Mr. Loudon's grounds last summer and wrote in regard to this berry in the *HORTICULTURIST*. They were evidently much interested in it. Our readers would be glad to hear further from any reliable source as to this new fruit.—**SECRETARY.**

"Your very welcome letter of January 27th, informing me of the action of the Minnesota State Horticultural Society making me an honorary life member of the society, is at hand, and I assure you that it gives me much pleasure to know that I am still remembered by my old horticultural friends. Nothing would be more gratifying to me than to have a good hand-shaking at some of your meetings.

"I received the report of your meeting and noticed that you put my seedling currant on the list for cultivation. I thought it the best currant that I had in my collection. It is a seedling from the White Grape currant grown by the side of the White Dutch, Red Dutch and Cherry currants. You will notice that it resembles the Cherry currant both in looks and flavor; it also has the marks of the White Grape currant. The seed was planted on my place at Le Sueur the summer of 1857."

AMASA STEWART.

A CORRECTION.—"In the discussion on raspberry, page 46, February magazine, I am made to say 'our land is not a very strong soil.' The 'not' should have been left out, as the soil is a black loam and had been highly manured. 'Marlboro,' on the next to the last line on page 49, should read 'Cuthbert and Shaffer.' I am not blaming the reporter for it, as I do, sometimes, make mistakes in speaking off hand."

J. S. HARRIS.

AN ENCOURAGING WORD.—"Yes, I think fruit growing in Minnesota is about as sure and profitable as elsewhere."

A. W. SIAS.

Harbor View, Fla., Jan. 25, 1896.

(Mr. Sias, having spent three years in Colorado and some time in Florida, after his thirty-one years in Minnesota, is well qualified to speak on this subject.)

Secretary's Corner.

CAN'T YOU send in a new member in April? Our roll *should* be doubled, and *you* being the one benefited are the person to do it.

GRAPE CROP OF 1895 IN THE LAKE ERIE REGION.—A little idea of the magnitude of the grape growing industry in the North may be gathered from the fact that in round numbers 4,170 car loads of 2,500 ten pound baskets each were shipped in 1895 from the region around Lake Erie. These are the grapes that come to the Minnesota markets. No wonder the price of Minnetonkas is "down."

LEND A HAND!—The growth of our society comes largely from the individual efforts of its members. Can't *you* send the secretary at least *one* new member during the month of March? By doing this you would be entitled to a copy of Prof. S. B. Green's "Amateur Fruit Growing," a book you should certainly own. The increase of the society means increased benefit to *you* and every other member.

A WISCONSIN MONTHLY.—Our sister society has decided to try its fortunes as publisher of a 32 page monthly. I do not know all the details of the plan yet, but if Secy. Philips is editor, as is probable, the enterprise is sure to be pushed with his usual vigor. They report a "good" meeting at Madison; all the old officers were re-elected. E. H. S. Dartt, our delegate, will give us a report of it for the April number.

DEATH OF SECY. D. N. REED, NEBRASKA.—News has just come to me of the sudden death, by accident on the railway in September last, of D. N. Reed, of Blue Springs, Neb., secretary of the Nebraska State Horticultural Society. He was elected the winter previous to succeed Prof. Taylor, who had held the office with marked efficiency for several years. Mr. Reed's wife filled the office till the annual meeting, at which J. H. Hadkinson, of Lincoln, was elected.

HORTICULTURAL LITERATURE AT THE FARMER'S INSTITUTES.—Mr. Clarence Wedge is supplementing his work as lecturer on horticulture at the farmer's institutes by distributing, at the same time, the fruit lists of the society and sample copies of our magazine. Fifty of the latter and 400 of the former have been sent from this office to each appointment where Mr. Wedge has been present during the winter, and we believe much good is being accomplished in this way.

A. W. SIAS.—For sketch of his life, prior to 1890, see report of 1891, page 92. His portrait appeared as frontispiece in the last number.

Mr. Sias emigrated to Pueblo, Col., in December, 1890, where he remained for three years, employing the most of his time in improv-

MINNESOTA STATE HORTICULTURAL SOCIETY.

city parks. He lived the whole time in Central Park, but and cared for trees more or less in Fremont Park. He then to Harbor View, De Soto Co., Fla., and went into fruit growing where he still resides.

IRVING FRUITS.—A process for preserving fruits, etc., by dried air has been patented by Dr. A. T. Perkins, of Chicago. It is claimed that by this means perishable products can be carried all over the world. If this claim proves to be well founded and the process is inexpensive, a revolution will come about in this class of commerce, in which all except, perhaps, some of the fruit growers, will receive the benefit. The products of Australia and California will be in the markets of Europe, and tropical fruits will be plentiful in America.

ISSUING THE FRUIT LIST.—Amongst the other work done at the late annual meeting of the past month, a copy of the last fruit list adopted by the society accompanied by a brief description of the general purpose of the society, was sent to every newspaper in the state, and to some of these, in all about 425. If you do not see the list in your local papers, it would be in order for you to inquire why information of such value is withheld. It ought to take the most prominent place in the paper, at least once, that the widest reader may be reached.

MEMBERSHIP RENEWALS.—If you are one of those who has overlooked renewing membership till now, please sit down at once and write to exchange for a membership ticket for 1896. Should you, for any reason, desire to postpone this for a while, kindly notify the secretary, or if you do not care to remain a member longer (happily a few in this class) please write also, that the secretary may delete your name from the rolls. It is the desire of this society to continue the list of all its old-time members upon the rolls. Being a mutual association, its interest and power for good lies in its membership.

FORESTRY COMMITTEE.—The committee has been announced, and appointment was provided for by the late annual meeting of the Forestry Association, to draw a bill for presentation to the legislature, putting in practical form the suggestion of Capt. J. M. Beale, that the state, as trustee, assume the charge of such forests as may be tendered to it, the proceeds to go mainly to the support of educational institutions. It consists of Capt. Judson N. Beale, of Minneapolis, H. B. Ayres, of Carlton, and Ed. A. Beale, of Minneapolis. The proposition if carried out would be far reaching effects and should and will receive the most careful consideration. If properly planned and successfully executed, it would establish a permanent and sure fund for education and result ultimately in a perfected system of forestry in our state, first for these lands and later, necessarily, for all the forests in the state.

Amasa Stuart

LAMARQUE, TEXAS.

A life member of the Minnesota State Horticultural Society.

THE MINNESOTA HORTICULTURIST.

VOL. 24.

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NO. 4.

Biography.

AMASA STEWART, LAMARQUE, TEXAS.

(See frontispiece.)

Amasa Stewart was born in Ohio, April 4th, 1828. He went to Illinois with his father in 1835, and was educated in the common schools of Marshall county, finishing with a two years' course at the Granville high school, in Putnam county, after which he settled in La Salle county, of the same state, and engaged in farming and the nursery business until 1855.

At that time he moved to Le Sueur county, Minnesota, where the wild indian was still roving. There he opened up a large nursery and continued there until 1865, when he was eaten out by the grasshoppers. The next year he determined to try a more central part and moved to Minneapolis, continuing in the same business and meeting with increased success. He gave special attention to the planting of shade and ornamental trees and furnished the material for beautifying many of the elegant homes of Minneapolis.

His health failing him, he left his beautiful home at Minneapolis November 7th, 1882, scarcely able to sit in the carriage to ride to the depot. Two days later he arrived in Denison, Texas, nearly exhausted, but he began to rally in a few days, and the next spring he was able to superintend the planting and gathering of his fruits and vegetables. He remained at that place until 1889, when wanting to get nearer to salt water he purchased lands on the main land eleven miles west of Galveston and near Galveston bay, which were generally conceded to be worthless except for grazing cattle. He divided the lands up into small tracts and planted fruits and flowers, and now they are giving in return fragrant roses and Cape Jessamines, delicious strawberries, blackberries, plums, peaches, pears, etc., etc., which is a great pleasure to him in his sixty-eighth year.

Mr. Stewart first became a member of this society in 1868, and was intimately connected with it thereafter until his removal to Texas. At the last annual meeting, he was unanimously elected an honorary life member.

IRRIGATION FOR SMALL FRUITS.

(Read at the winter meeting, 1895, of the Southern Minnesota Horticultural Society.)

It has become so common for a dry spell to occur sometime in the life of our small fruits in this state, that the question of irrigation is being seriously considered. This question came up before me six or seven years ago, and I propose to tell you how I answered it. After losing part of my strawberry crop every year by drying up, I concluded to try watering them. At first I hauled water on a wagon from a lake half a mile distant and put it on with pails; but it was slow and hard work, though it made the berries grow larger and better; finally I dug a well in the middle of my garden to have the water near at hand, built a platform about eight feet high near the well, put a kerosene barrel on the platform, and, with some old three-quarter inch gas pipe and some troughs made of six inch fencing, the water, after being pumped into the barrel, was conducted to the middle of the patch. We still carried the water in pails and poured it on the row. It did very well and had the desired effect. This was my first irrigation plant.

But we never seem to be satisfied in this world, so the next year I built a tower sixteen feet high over my well and put a tank that held fifteen barrels on it. This was about eight feet higher than the highest land on the place. Then I run a line of gas pipe from the tank through the middle of the strawberry patch, each pipe being about fifteen feet long, with a T coupling on every second pipe to attach to at right angles to the main line, and with a three-fourths inch rubber hose twenty feet long and a one-fourth inch nozzle I was ready for business. It took some time to establish a system of applying the water, but we finally settled on the plan of putting two lengths of pipe at right angles with the main line, then attaching the hose, with which, being twenty feet long, we could water a square of forty feet; then two more lengths of pipe and so on through the patch, when we would have a piece watered forty feet wide across half the patch. Then we move down the main line to the next T, taking up the side line just used, and water another piece forty feet wide across the patch, and so on until all on that side of the main line was watered. Then we take the side line pipes and go over to the other side of the main line and do as we did at first. One man pumped and put on for me fifty barrels a day, or one acre in three days.

As to putting on the water after the hose is attached to the pipe, coil it up so as to carry it on the left shoulder, and with the nozzle in the right hand direct the stream onto the middle of the row, moving fast or slow according to the amount of water desired. As you move away from the pipe, drop a coil of hose, and you will soon get used to it.

The berries should be well mulched with straw to keep the fruit from getting dirty, and the water sinks down under the mulch and does not dry out so soon. The results were very satisfactory; the berries grew of large size and kept their size longer than usual. When the first berries were picked, we found berries, blossoms and

buds which came on in a natural way, and we had very few knotty berries, such as we had without water. Our crop was very much larger, and when other berry raisers were done picking or had only a few dried-up, knotty berries, ours were good, smooth berries until the last. When the others were done selling, we had plenty and the whole trade to ourselves. Prices came up from eight cents per box to ten cents per box.

As irrigation was a new thing at first, I did not know how to go at it, so I made inquiries among those who, I thought, might know, but did not get much encouragement, as they were in the same fix as myself. Some parties had been to California and Colorado, but we have no mountain streams to flood our lands, and I soon found we must pump the water we used. One friend told me it would not work, for well water had not the virtue in it that rain water had, and it would not do any good; another said well water was so cold it would do more injury than good, and it might kill the plants unless it stood in tanks long enough to get warm. Then we read that in watering the garden it must have a good soaking, or it would be time thrown away, but I found watering often in the row is as good as, if not better than, a flood.

In watering blackberries or rows of bushes of any kind, lay your pipes between the rows in such a way that with the hose you can reach three or more rows on either side. I remove the mulch near the hill and dig a hole large enough to hold three or four pails of water and lay the nozzle in and let it run until the hole is full, and while it is filling dig more holes and fill in those that have been watered with mulch, but not with earth, so that next time you will have to take out the mulch only. I lost most of my blackberries in '95, as my well gave out entirely, it being what is known as a surface well, but since then I have put in a tubular well, with plenty of water, with tank sixteen feet above the highest land and shall use a small one-horse power, so I can have water whether the wind blows or not.

I suppose you have read something about sub-irrigation. For such things as blackberries, raspberries and such bushes, that can stay for years in the same place I think it would be just the thing. I intend to try a few rows the coming spring. By plowing a ditch one foot deep and laying two inch tile in it where you wish to set the row, applying the water at the highest place in the row and filling the tile from the tank as often as needed, it would be the cheapest and take less water than any other way. When the tile are once laid down, it will do for anything else for a long time.

APPLE TREE LEAF FOLDER.—Apples and roses are also very frequently infested with a leaf-rolling caterpillar, belonging to the family of Tortricidæ. In some seasons the Russian apples are injured to such an extent as to lose all their leaves and are forced to do two years labor in one, which is of course very weakening to these plants. Roses that are not constantly watched will soon lose most of their leaves by such insects. Early and repeated applications of Paris-green or London purple would prevent all these damages.—Minn. Ex. Station, Bulletin No. 43.

THE NEW HYBRID SAND CHERRY.

H. KNUDSON, SPRINGFIELD.

This new fruit, which was originated by me, is a cross (which I made in the spring of 1891) between the sand cherry (*Prunus pumila*) and the Miner plum. It is botanically called a cherry. Years ago I received plants of the sand cherry, native to eastern Minnesota, from J. S. Harris, and latter on I read an article, written by Prof. J. L. Budd, stating that a cross, no doubt, could be made with it and the tame cherry, which I had imported from Denmark, Europe, in the spring of 1884. The Miner plum I had a year later, and have all these growing in my garden. I had determined to plant some sand cherry pits to see whether there would be any improvements in that way. I thought of Prof. Budd's article and that I would try the experiment. I had never done any such work and went at it in a somewhat rude manner. It was in the spring of 1891. I did not remove that part of the blossom which bears the pollen, except upon one blossom, that one being near the ground and covered up with a leaf of the sand cherry. I took whole flowers from the Danish morello cherry and from the Miner plum, being the only ones to secure pollen from at that time. I applied the pollen of these, both at the same time, to the blossoms of the sand cherry and covered up this blossom on the sand cherry each time with this leaf, which naturally answered the purpose. I did this several times, now and then, after which I left it alone. The other blossoms on the sand cherry bush were not protected. The fruit from this protected blossom when ripe was much larger than the others on the bush, which were mostly carried away by birds, were small and I cared not so much for them. I planted the one I had protected by itself between two sticks, and from it came the hybrid.

I did not think any more of what I had done till sometime after, in the spring of 1892, when this seedling came up, which reminded me of the crossing work I did in the spring of 1891; and when in 1894 this hybrid seedling fruited at three years old from the seed, everything showed that the sand cherry had partaken of the pollen from the Miner plum. The tree also fruited again this year (1895), in spite of the heavy freezing in May being the worst we ever had here and which ruined nearly all the other stone fruits I had on my place, including the choke cherry, bird cherry, sand cherry, four or five kinds of the tame cherry and many kinds of the native plum. The crop from this, my hybrid sand cherry, exceeded by far that of last year, thus promising to be a productive variety and a sure fruiter, even when others fail, and a valuable tree to plant on this account alone, being so far the hardiest of all the stone fruits and a young and early bearer, and the fruit being the best in quality. The tree is of an upright growth and is, in itself, ornamental. 'It is,' something entirely new, distinct and different from anything known or grown in the fruit line heretofore, a vigorous and healthy grower, and the tree and fruit are, so far, free from insects and disease, in short, free from all objections. It has the best root system, similar to that of the sand cherry, which it resembles in color of bark, leaf and

fruit buds. The leaves are somewhat similar, but finely and evenly serrated, larger, more widened, but not so trough-like as those of the Miner plum. The form or shape of fruit is its own; skin very thin and free from all of the unpleasantness found in some of our other stone fruits, and the fruit can be used for most purposes for which our other stone fruits are used and will, no doubt, find ready sale in any fruit market, being an amber colored, even sized fruit, about one inch in diameter, more or less.

The tree is not affected by our hot, cold, wet or dry seasons, neither by the sudden changes, but is well adapted to our climate and will grow where others fail. The fruit this year ripened nearly a week earlier than last year, coloring up the latter part of July. I picked ripe fruit the second or third of August, 1895. I had girdled a couple of small limbs to see its effect, and the fruit on these ripened about a week earlier, the last picking being on the 15th or 16th of August. The tree being shaded on the south and southwest by taller trees close by was the reason for the fruit not ripening up all at the same time.

I have sent out samples of the fruit this year (1895) to several parties to get their opinion of it. The original tree (for certain reasons) is about six feet high now, is without thorns, is easily propagated by budding or grafting and unites well with the stocks of our native plums, possibly with other stone fruit stocks, and may possibly be grown from cuttings in a moist soil.

The original tree may be seen on my grounds; all are welcome to see it, and I will be pleased to show it. To those who may wish to know all the facts and full information regarding this my "Hybrid Sand Cherry," I will upon application for same explain it if the party is willing to pay postage on same, as this paper does not mention all the important points which would make the paper complete.

THE PERKIN'S PROCESS OF PRESERVING FRUITS.

REPORT OF PROFESSORS HILGARD AND SMITH.

(Made to the California Fruit Growers' Convention.)

The process embraces two main points, to-wit:

First—The longer preservation of the fruit by the effect of a slow current of air having a minimum temperature of 55° to a maximum of 65° Fahr. passing continuously over it.

Second—The maintenance of this temperature at all times in the hot desert as well as in cold winters by appropriate means not involving the use of ice, the refrigeration being accomplished by the expansion of compressed air.

The committee have not had the opportunity of witnessing the process in operation, and as regards the results must rely upon the statements of Dr. Perkins (the correctness of which they have no reason to doubt) and the testimony of one of their number, Professor Smith. The efficacy of a current of reasonably dry air in promoting the conservation of fruit so as to insure its arrival in good condition, even after a considerably longer transit than now commonly occurs, seems thus to be placed beyond doubt. Fruit thus conserved has

the additional advantage that upon arrival at destination it will not under the influence of moist air become covered with condensed moisture, as inevitably happens when it has during transportation been maintained at a low temperature by refrigeration with ice. That such bedewing of the fruit is highly injurious to its keeping quality is well known. The Perkins process apparently obviates this difficulty and leaves the fruit to arrive and remain perfectly dry. It is but reasonable to suppose that its life will thus be materially lengthened while in the hands of the dealer and consumer—an advantage which it is difficult to overestimate, especially if, as is claimed, fruit to be thus treated may be more fully matured at the time of shipment.

As regards the second point, viz: the maintenance of the air current at the uniform temperature of say 55° to 60° without the aid of ice, even in the hot desert air, there is no question that it can be accomplished by the means claimed, viz: the compression of air by means of a pump; then, after giving it time to cool down to the outside temperature—say 120° at most—allowing it to expand under proper conditions, reducing its temperature and, therefore, that of the air current to 55° or less. The proposition is theoretically sound, and it seems possible to make it practically feasible with perhaps only a slight addition to the weight of an ordinary car in the way of reservoirs and minor appliances, the exact arrangement, size and form of which must be determined by experience. As regards the maintenance of the same temperature in winter, there can be no difficulty about making the same appliances answer the purpose of heating by the addition of a steam coil or otherwise.

We are, therefore, of the opinion that this invention deserves the most earnest consideration on the part of the fruit growers, transportation companies, and all interested in the fruit industry, since it appears to offer a simple and (as compared with the ice-refrigerating process) inexpensive solution of the problems both of cheaper transportation and of better conservation of fresh fruit.

THE ALICE GRAPE.

(From report of a committee of the Southern Ulster, N. Y., Horticultural Society.)

“Of the fruiting vines there are about a dozen, including the original seedling. Their bearing capacity was not exaggerated by the specimen branch exhibited at the fair, all the vines showing a prolific crop. Its growth is remarkably strong, many branches of this season's growth being a dozen feet long or more, the wood ripening up uniformly. The foliage is exceptionally healthy, the large, thick leaves plainly distinguish it from all other varieties and enable it to resist mildew and rot, which appear to have had little if any effect upon it, although the season has been remarkable for the prevalence of those maladies, which the vines of other varieties immediately adjoining plainly show. The berry is of good size, nearly as large as Concord, has a tough skin, without astringence; pulp meaty and tender; flavor fine and quality high; seeds few and small, ranging from 1 to 3, averaging about 2. It adheres

long or short—were it shorter than it is the clusters would necessarily crowd each other.

"During the winter of '85-86 a vine was left tied to the upper wire, and in the spring appeared alive to the terminal buds and set fruit throughout.

"Your committee would say that this vine now has 68 clusters on it, probably weighing 25 pounds. One of the young vines (second year's fruiting) shows 48 clusters, probably weighing 16 pounds, and a larger average than those shown at the fair. It appears to ripen with Concord, hold its fruit firmly, seems rich in saccharine, and has every appearance of being a long keeper and excellent shipper."

ANTHRACNOSE OF THE RASPBERRY.

(*Gloeosporium venetum*, Speg.)

R. S. MACKINTOSH, ST. ANTHONY PARK.

In considering the subject of anthracnose, we have to note the fact that it is a disease that has come upon us within recent years; not more than fourteen years ago it was first described briefly by Professor T. J. Burrell in the *Agricultural Review*, November, 1882. Probably the first detailed description was in the report of the Department of Agriculture in 1887, in which it states the territory over which it prevails. The following is part of the report that appeared in 1887 from the Department of Agriculture:

"That the disease is directly due to the action of a fungus which is a true parasite there can be no question.

"*On the Canes.*—The fungus attacks both fruiting and non-fruiting canes or suckers. On the latter it usually appears first near the base, producing small purple spots, that are variously scattered around the cane. The spots, first formed, rapidly increase in size, and as the fungus develops the center of each becomes grayish white in color. Surrounding each spot is a slightly raised, dark purple border, separating the healthy from the diseased tissues. The course

Raspberry cane affected with anthracnose (cane rust).

(From Minnesota Experiment Station Bulletin 39.)

of development is from the lower portion of the canes upwards, so that at any time during the growing season the tip of the cane shows only the minute purple spots, or early manifestations of the disease, while towards its base are found the older and larger spots. In an advanced stage of the disease, the spots coalesce, or run together, and appear as irregular blotches, which are frequently an inch and a half long and sometimes completely encircle the cane. The direct damage in the tissue rarely extends to the pith; the greatest injury is confined to the cambium layer, or the

portion through which the sap is conveyed in the process of growth. Thus, nearly the same effect is produced on the cane by the action of the fungus as would result to a living tree if girdled by the knife or ax; the living tissues of the canes are prevented from properly performing their work, and as a result become sickly; the leaves do not attain more than half their normal size, and if fruit is formed at all it never reaches its full development but ripens prematurely or simply dries up and is worthless. If the young canes are not killed the first year, the continued action of the fungus on the leaves and branches prevents the formation of fruit the succeeding year.

"The leaves and leaf stems are usually one-sided and not fully developed. This is caused by the fungus attacking only one side of the leaf stalk and some veins of the leaves. The characteristic spots are soon developed on parts of the leaves. These spots on the leaves are not as large as on the canes but usually closer together. The injury extends through the tissue of the leaves, and frequently the diseased part separates from the surrounding healthy part, and the leaf becomes riddled with holes."

At the present time, it is destructive over a very large part of our country. Many experiments have been conducted seeking to find some remedy or prevention which will stay its ravages. I have written to several of our leading horticulturists throughout the infected section and will give below some of their replies.

Professor L. H. Bailey, of Cornell Experiment Station, N. Y., gives the following in Bulletin No. 100:

"*Anthracnose*, or *cane rust*, is much to be feared. It is not very apparent on the plant, and it may spread into all portions of the patch before it is detected. In the form of the disease which the grower needs to be able to recognize, there are various pits, or scars, on the young cane, each one probably a distinct infection of the disease. These discolored pits interfere seriously with the health of the plant, causing the leaves to turn yellow and the canes to die if the trouble is extensive. Much of the drying up of berries on the bushes is due to attacks of anthracnose on the canes or near the clusters, and some of the deaths of plants commonly ascribed to winter killing is attributable to the same cause. The disease is particularly bad upon the blackcaps and the Shaffer. It first appears very early in the season upon the newly starting shoots, and it generally continues to attack the shoots as they increase in height. The first indication of the attack which the grower will notice is the presence of small purplish discolorations on the canes. The disease also attacks the leaves.

"It would seem as if the disease could be prevented by keeping the growing canes covered with Bordeaux mixture. If this is tried, the fungicide should be applied whilst the shoots are less than six inches high, and the application must be repeated every week or ten days until the cane has grown to a height at which the disease will not injure it. Green has been able to keep plants free from the disease with both Bordeaux mixture and ammoniacal carbonate of copper.* He advises four sprayings, one of them before growth begins, and the last just before blossoming time. Beech has had sim-

* Bull. 6, Vol. iv, Ohio Exp. Sta. 119 (1891).

ilar results.† The bushes were sprayed six times. Late in November an examination showed that 'the canes in the treated rows were nearly free from disease, whilst those that were not sprayed were still very badly affected.'

"Mr. L. T. Yeomans, Walworth, made a similar test this year, under our suggestions, upon Gregg. He sprayed with Bordeaux mixture as follows: May 16; May 20 (repeated thus early, because the first spraying seemed to have hit the leaves more than the canes); May 29th; June 7th. On newly set plants these applications were made and also the following additional ones: June 13th; June 17th; June 26th; July 9th. These applications were made carefully and thoroughly, but neither Mr. Yeomans nor myself could detect any immunity from disease on the sprayed plants. It should be said, however, that the disease was slight upon all the plants.

"My associate, Mr. Lodeman, made a similar experiment this year in the university gardens, and his account follows: 'Two varieties of raspberries were selected, Shaffer and Ada, one part of the rows being repeatedly sprayed with Bordeaux mixture. The first application was made May 18th; this was followed by others on June 13th, June 26th and July 11th. The plants and canes were each time deluged with the mixture to such an extent that they lost their normal green color and appeared as blue as the mixture could make them. It was found that the canes could not be nearly so well protected as the leaves, as the liquid refused to adhere to the glaucous surface; it collected, however, upon the ends of the thorns, giving them a marked blue tip.'

"Some plants of both varieties received only the two applications made in June, while certain Shaffer plants remained untreated. Notes taken August 2d and 28th show that the fungicide had been of some value in checking the anthracnose, but the effects were not so marked as was desired. The canes of the unsprayed Shaffer were very much pitted, the older and larger ones being considerably swollen and bent in places. The smaller canes as well as the leaves also showed an abundance of infected places. The portions of the rows which received the two treatments in June were not in much better condition than the untreated plants. The lower portion of the canes was severely attacked, and although the number of pits did not appear to be so abundant, still all parts of the plants were more or less affected. The bushes receiving the greatest number of treatments were the most healthy, but the benefits derived from the fungicide were not sufficiently marked upon either variety to encourage a grower to repeat the same line of treatment. Some protection was undoubtedly afforded, and the plants were plainly in better condition than their untreated neighbors, yet the use of the Bordeaux mixture during the growing season cannot be recommended as being of much practical benefit. If the bushes are to be sprayed, the first application should be made as soon as the new canes appear, and these should be kept covered as well as possible. If some more adhesive material than the Bordeaux mixture were employed, better results would probably follow.'

† Bull. 81, New York State (Geneva) Exp. Sta. 592 (1894).

"These various results are conflicting. For myself, I do not believe that spraying alone is sufficient to keep down the anthracnose. The very first requisite to clean patches is a short rotation. Remove the plants just as soon as they become weakened, either from anthracnose or age; next, thin out the young canes and exercise care to remove and burn those which are most diseased; third, cut out and burn the old canes just as soon as the fruit is off. These three operations are essential to the best raspberry culture any way, and if the anthracnose succeeds in enforcing them upon the attention of growers its mission will have been fulfilled. If, therefore, a patch became very badly diseased, I should pull it out; or if that were too violent then I should mow off the bushes in fall, burn all the brush and the following year soak the new shoots with Bordeaux mixture as they grow. By sacrificing a year, it might be possible to eradicate the disease. But I am sure that it can be kept in check by attention to the three operations which I have mentioned."

Prof. E. S. Goff of the Wis. Exp. Station reports, "The disease at this station and in some localities is quite serious, as at Sparta. I have generally recommended the Bordeaux mixture as the best preventive that I know of. I made the experiment on our own grounds of spraying with the Bordeaux mixture, but was not fully satisfied as to the benefits received."

Probably Prof. W. J. Green of the Ohio Exp. Station has as much practical experience as any one, and he reports as follows in a letter to me:

"I send a bulletin which mentions the raspberry anthracnose. We succeeded quite well in keeping the disease from the plants, but in our later experiments there has been so little anthracnose present that the results are not very decisive.

"I think that one treatment before the leaves open is essential, and after that it is very necessary that care should be taken to spray the young canes only, as the mixture injures the leaves on the old canes but not on the young. Of course, this requires some care, but it can be done if one is careful. The first application to the young canes should be made before they have reached the height of six inches or as soon as they begin to come up. Only one more is needed, and that before the shoots reach the height of one foot. This brings the sprayings very close together, but no other course is practicable.

"I may say that others have not always succeeded as well as they could wish in checking the anthracnose, but I think the failure is largely due to the fact that they have not been prompt enough in the work. We use Bordeaux mixture, 4 lbs. copper sulphate to 40 gals. water, for the first spraying, and half that strength for the subsequent ones."

In summary of this question it seems to me that the best preventative that we know of today is what the writers have mentioned.

Care is necessary in selecting varieties that are best adapted to the location and that are as free as possible from anthracnose. Very few of the writers name any particular varieties, except in a few instances. Most all agree that the black varieties are more sub-

ject to it than the reds. Of the red varieties, the Shaffer and its seedlings are the worst.

This season at the university farm we noticed very little damage from anthracnose on the black raspberries, no doubt due to the thorough spraying that we did last season (1894).

When spraying is undertaken, it must be done with the understanding that it must be done *thoroughly* and at the *proper time*. No doubt the best routine to follow is as given by Prof. Samuel B. Green, in bulletin No. 39 of the Minnesota Experiment Station, viz:

"In the spring, before the canes start, spray them with a solution of sulphate of copper (blue vitriol) made by dissolving one pound of it in fifteen galls of water. Later, spray the new canes with Bordeaux mixture, probably about three times, at intervals of about two weeks, commencing as soon as the new canes are one foot high. Care should be taken not to get the Bordeaux mixture on the leaves of the fruit-bearing canes, as they are quite liable to be burned by it."

Prof. S. T. Maynard of the Mass. Exp. Station reports, "We find that varieties very much subject to its attack have become almost free from injury by spraying with the copper and Bordeaux mixtures. Our routine of spraying is this:

"First. Before the leaves unfold cover the canes with the Bordeaux mixture, 4 lbs. lime, 4 lbs. copper sulphate and 25 gallons water.

"Second. Just before the fruit reaches size to be disfigured, would spray again with same, but confining the spray to the lower leaves and canes.

"Third. After the fruit is gathered, spray once more.

"With this treatment, there will be copper on the canes and leaves all summer, and neither anthracnose nor septoria will be injurious. With us, septoria does more harm than anthracnose."

Pres. Underwood: There were some questions asked in regard to Mr. Mackintosh's paper on "Anthracnose," and if there are any here who wish to discuss that subject or ask any further questions they can do so.

Mr. Pond: Is it the disease that is sometimes called the "curly leaf"?

Mr. Mackintosh: No, it is not the same. "Curly leaf" attacks the leaves, while this troubles the stem.

Mr. Pond: Does "curly leaf" attack the roots?

Mr. Mackintosh: I am not acquainted with that.

Mr. G. J. Kellogg: When is the most successful time to fight it by spraying?

Mr. Mackintosh: Early in the season, covering the old canes before the new canes have started.

Mr. Kellogg: You say early; before the leaves start or after?

Mr. Mackintosh: Before the leaves start; it is apt to burn the leaves on the old canes. Cover the old canes first.

Pres. Underwood: Is it the intention to take up this solution in the circulation?

Mr. Mackintosh: It is simply intended to cover the outside of the surface of the cane to prevent any of the fungus getting a hold and growing on the bark.

Pres. Underwood: There have been some questions asked about the "curly leaf."

Mr. Sargent: I was wondering whether the "curly leaf" was the same as anthracnose. At Red Wing the raspberries were afflicted with it so badly they would never produce a crop of fruit; that is, I am speaking of the Cuthberts. The Turners right alongside of them were not affected at all. There is another trouble with us. There is an insect that lays eggs in the stalk, and it weakens it, and a good many times the stalks leave out and then break down.

Mr. D. Cook: That is the snowy tree cricket. I have that on my place. They lay eggs in the stalk for a length of three or four inches, and those little eggs hatch out worms next spring. We cannot destroy them, because they are all over the raspberries and all other plants that have a pithy stalk in which they can lay their eggs. They lay their eggs in any kind of wood they can get into.

Pres. Underwood: Any remedy for it?

Mr. Cook: I do not know of any except to cut out those canes, and that would not be practicable.

Mr. Kellogg: I have got it all out of mine.

Mr. Cook: They will come in again.

Mr. Pond: Have you ever seen the insect?

Mr. Cook: Yes, I have seen the insect. It is about so long (indicating) and is a dark brown color.

Mr. Pond: How long have you been troubled with this snowy tree cricket?

Mr. Cook: For six or seven years.

Mr. Pond: We used to be troubled in Wisconsin with it, but for the last few years it has been very light. I did not know but what it had had its day.

Mr. Kellogg: I would like to ask Mr. Mackintosh if the application of Bordeaux mixture on strawberries has any effect on rust.

Mr. Mackintosh: I will let Prof. Green answer that.

Prof. S. B. Green: We have experimented for several years

at the station using the Bordeaux mixture, and with very favorable results, indeed, but I found that after I had renewed a bed by burning it off that it destroyed about all the fungus, so that we had very little trouble with it. Since we have been burning off our beds, we have very little trouble, although this year I noticed some in spots. My new bed is clean. I find burning to be very reliable, as it destroys the fungus.

Mr. Kellogg: When would you make the application?

Prof. Green: I should begin in the summer or earlier, just as soon as the mulching is removed. I think we should wait until they start to grow a little. There is no use in putting on the Bordeaux mixture as a remedy; it is not a remedy. In regard to the snowy tree cricket, we have had them more or less at the farm, and I have had them sent to me from a good many sections of the country. It is sometimes quite injurious, so far as I know, as this gentleman from Wisconsin has said. We have it for a few years, and then it disappears, probably due to some parasite, then it comes back again, and, as Mr. Cook says, it works in almost anything, but I think Mr. Cook is a little mistaken in his description of the mature cricket. It is that green insect that gets in the house in the fall of the year and makes a chirping noise.

Mr. Kimball: What have you to say about the anthracnose?

Prof. Green: I saw Mr. Mackintosh's paper, and I think that about covers it. I believe the best treatment is to apply sulphate of copper, one pound of sulphate to twenty-five gallons of water, and spray the canes before they are laid down. That kills everything. After it gets to the inside it may work in winter. In the spring of the year, I believe it would be a grand idea to spray with sulphate of copper. The Bordeaux mixture is a very good remedy and safe. One thing about it is that Bordeaux mixture will burn the leaves on the old growth but not on the new growth. The new growth seems to have the power of resisting its effects more than the old growth. The time to spray is just when the shoots are coming out of the ground, and perhaps after, but if you leave it until later the new wood will get up in the old wood, and you cannot reach it without getting it on the old wood, when it will burn the leaves on the old wood. Use that treatment, and it will cure anthracnose completely. In the Eastern states, it is a good deal worse than it is here. I visited Prof. Maynard in Massachusetts, and he showed me some blackberries, and he said the only thing he could keep them healthy with was the Bordeaux mixture.

About this leaf curl, no one knows anything about it. We do not know the real history of it. I can remember as long ago as 1882 it was very injurious. When I found it so bad here, I wrote to Prof. Bailey, of Cornell, but he could give me no information—he had never heard anything about it. This summer I was at the Geneva station and looked it over with Prof. Beach, and while we were walking along I asked him if they had the leaf curl; he said they had none of it. I asked him to wait a few moments while I looked at his raspberries. I saw his Cuthberts were diseased, and I asked him what it was, and he said it was leaf curl, the first he had ever seen.

"THE DALLES OF THE ST. CROIX."

FRANK H. NUTTER, LANDSCAPE ARCHITECT, MINNEAPOLIS.

Above the Dalles.

To most of the inhabitants of Minnesota and Wisconsin, the locality of which we write is an unknown one, or at best only remembered on those occasions when the papers call attention to the fact that so many million feet of logs, "the largest jam on record," have accumulated in the Dalles of the St. Croix, and the lumbermen and river-drivers are summoned to their dangerous task of "breaking the jam"; and it will come as a new revelation to be assured that probably nowhere else in the state can there be found within a similarly circumscribed area so much of interest to the scientist, the artist or the ordinary tourist in search of rest and recreation.

In the Dalles

The geologist, with these basaltic cliffs for a text, can take us back in imagination to the time when the earth opened, and from beneath the powers of fire forced up the molten lava which now forms the extensive "trap dykes" which traverse this section of the country; and then in more recent periods show us the roaring torrent of the river, as it slowly wore away the gorge through which it now flows, while in some of the eddies stones revolving with the motion of the water gradually cut out and polished the "potholes," or "wells," which are now found near the village of Taylor's Falls and regarded as such curiosities. These "wells," bored into the solid trap

Below the Dalles.

rock, vary from six inches to four or five feet in diameter and from two to thirty feet in depth, and in their grooved and waterworn sides give evidence of the method by which they were made.

If we follow a short distance down the river, we reach a different scene; the trap rock with its fantastic forms is left behind, and we are confronted with cliffs of white or colored sandstone, towering above us perpendicularly; and here our instructor can point out to us the forces of nature still at work, for we find the springs and little streams trickling down the face of the cliff, gradually cutting it back in places in the form of a nat-

In the Dalles.

ural amphitheatre, and we note that even the green moss which drapes the sandrock is gradually disintegrating it and preparing it as an ingredient of the soil.

The botanist also finds interesting specimens here for his study, for we are assured that almost every species of plant known in this latitude may be found among these hills and gorges, while in the moist shade of the ledges rare and striking varieties of ferns are growing, and in the forest fine specimens of our native trees are seen. As may be expected, the larger pines are mostly removed, but young seedlings, abounding in spots, give promise that their places may at length be filled again.

The naturalist is also afforded objects for study, whatever his special field may be; the fisherman may choose from the "channel cat-fish" of the

The Sentinel. In the Dalles.

river gorge, the bass of the neighboring lake or the trout of the tributary brooks; while the artist revels in the riches set before him, either in the sparkling rapids, the dark depths of the river in the Dalles, the craggy hills or the fantastic rock forms, some of which are shown in the accompanying illustrations.

The so-called "practical man" has also looked upon these cliffs and announced that in connection with convenient means of transportation they may be profitably attacked with dynamite, and with the aid of the stone crusher made to serve our day and generation in macadamizing city streets. Fortunately this project did not materialize,

The Devil's Chair. In the Dalles.

but it worked good in that it created an interest in preserving this beauty spot, and, though time was short, legislative action was taken in Minnesota, under which a tract of about 150 acres has already been secured by the state. This will preserve the "Upper Dalles" from desecration, but it does not include the sandstone cliffs or the "Lower, or Franconia, Dalles" which are also wonderfully picturesque. To embrace these, about 200 acres more should be added to the state's present possessions, which, as it is most of it almost valueless for agricultural purposes, may be purchased for an almost nominal sum.

The legislature of Wisconsin at its last session, at the eleventh hour, took similar action to that of our own state, but nothing has as yet been done in the way of securing any of the land, but some action will probably be taken ere many months more elapse. On the Wisconsin side of the river the scenery is somewhat different from that on the western bank, but with its semi-mountainous hills enclosing a beautiful small lake, and its wooded meadows opposite to the frowning sandstone bluffs of Minnesota, it is an admirable complement in the way of landscape effects, and it is to be hoped that in designating the lands to be taken the Wisconsin commissioners may be prompted to take a broad and liberal view of the matter.

It is, of course, unnecessary in this connection to enlarge on the desirability of preserving intact for future generations this spot, which one well fitted to judge has pronounced "the most picturesque locality this side of the Yellowstone Park," but we would urge attention to the fact that official action in a matter like this rarely goes much in advance of public sentiment; so let all interested plead with their local representatives and senators and those in places of influence to do all that they can to forward this matter; and if any of our readers are citizens of Wisconsin let them do the same, that the "Inter-State Park at the Dalles of the St. Croix," may be one that both states may rightly be proud of.

THE NEW STRAWBERRY CULTURE.

At the last meeting of the Western New York Horticultural Society, Mr. L. J. Farmer, a strawberry specialist, explained his new system of managing strawberries. Instead of setting the plants as early in spring as possible in the more or less carefully prepared patch, as is usually done, he first trenches them in rather closely together, leaving them there until late in May, altogether perhaps six weeks, during which time they are given frequent sprayings with the Bordeaux mixture for leaf blight, if at all affected. The job of trenching in is done in the simplest manner, by plowing a furrow and setting the plants to the landside, about twelve plants to the running foot, then covering with the hoe.

During all this time, the land intended for the strawberry patch may be plowed and cultivated frequently to bring into fine tilth and to destroy all early weeds that may have germinated. The plants are then carefully removed from the trench with a lump of earth adhering to the roots and planted the usual way. The fine rootlets, which began to grow while the plant was trenched, will enable it to bear removal and replanting more successfully than if planted directly from the nursery, and they will grow at once with scarcely any failure.

TOPWORKING THE APPLE.**A. J. PHILIPS, WEST SALEM, WIS.**

Mr. President, Ladies and Gentlemen: When first asked by your secretary to present a paper on this important subject, my first thought was to politely decline, as I had talked of it so much at your meetings that it would only be a repetition of what I had before said, but when I took into consideration the many inquiries I am constantly receiving, both from Minnesota and Wisconsin, on this branch of horticulture and the great importance I place on it in my own or any other orchard in a trying climate, I concluded to accept the invitation, and the result is I am here, and if I can create any new interest or throw any new light on it so that Northwestern horticulture may be advanced, then I am well paid for coming. At the outset I will say that what I offer in this line will be largely the results in my own orchard, as I have more of this work there than I have seen in any other orchard in the state, experimental or otherwise; and, further, I shall have to be guarded in my remarks and not give an exaggerated account of it, as during the past year two of your members, Mr. F. G. Gould and Mr. C. W. Sampson, visited my place; Prof. Goff of Wisconsin, also visited the orchard and gave an account of what he saw in your magazine last fall. I will briefly outline the subject and then will try and answer any questions on it. We are drilled to be brief at our institutes for lack of time, and twenty to twenty-five minutes is about all a fruit man can have.

Mr. Wyman Elliot: I want to interrupt you to ask a question. Why can't you have more than twenty-five minutes.

Mr. Philips: Well, the rank and file of the people do not care for horticulture, and our programs are all printed, and all we can get in our institutes on horticulture must be limited to that time. I told the people in one place if they would appoint the second evening for horticulture they could have the whole management of the meeting. Well, we held the meeting, and Mr. Coe was there with me, and they kept him on the floor for over an hour answering questions, and I spoke to them awhile, and we had a two hours meeting. Three weeks after that, they held a meeting to re-organize the society, and they asked me to come down and talk to them. I did so, and when on the floor I said: "Ladies and gentlemen, I do not know just what to say; I was here three weeks ago and told all I knew. If I could remember what I said to you then, I might say something tonight that would interest you." The president rose and said: "Mr. Philips, you need not stop on that account, because that doesn't make any difference. I was there and I don't remember a word you said." (Great laughter). Now, if you do not remember what I say about topworking, you will not be much the wiser. I have been grafting and budding and talking it for over twenty years, and I do not know any one in the state that is doing as much of it as I am. You tell people to topwork, and they say it is too much work. Mr. Wilcox, of La Crosse, was the first one at our meetings to advocate it; that good old man urged it years ago, and we only laughed at him, but after a while we had to come to it.

The first time I was impressed with the idea of doing it was at your meeting held at Rochester, the year you offered the premium for the best essay on topworking. That year I bought some Virginia crab trees from Mr. Grimes. Mr. Sias gave a \$5.00 premium to the one who could show the best growth of an apple tree. He had a shoot of the Virginia crab that had grown five and one-half feet that season. That convinced me that it was vigorous. I went home and topworked five different trees. When I get hold of something new, I am anxious to get it to growing as soon as possible, so I secured scions and topworked as soon as I could. I topwork for several reasons, and the first is to increase hardiness; I have proved that to my entire satisfaction. Then I topwork to increase longevity, and I have abundant proof that it does that. I topwork to increase productiveness, and I have proof that it does that. I topwork to increase the size and quality of the fruit, and I have proof that it does both. I wrote two years ago to Prof. Bailey, of Cornell,—he wanted some leaves and fruit of the Virginia crab—I sent him some—he wanted to see some fruit that had been topworked. I sent him an Utter's Red, Wolf River, McMahon White and Wealthy. Then I sent him the same number of specimens that grew on their own roots of the same varieties. His answer was this, that every apple of the topworked trees was as good in quality as it was on its own roots, and he said he thought the McMahon White was a little better. I topwork to increase size. I took those four varieties because they had such good fruit. I have trees in my orchard topworked on the Virginia crab, labelled "for exhibition purposes." I get better specimens. I took to our fair last year topworked specimens of Utter's Red that were the finest I saw there. In regard to the quality, I do not see why the quality should deteriorate any, for the reason that the Virginia when ripe is of a good quality.

Now, to tell you or to show you that I believe what I preach, I will say that for three or four years I have been setting two hundred trees a year. They are Hibernial, Duchess, Lougfield and McMahon, but every alternate tree is a Virginia crab. People might think we were going to have a large lot of Virginia crabs, but I topwork them as soon as they are fit. I have topworked trees there that will stay. Now, I said a moment ago that I topworked to increase longevity. Fifteen years ago I had about fifty Haas trees on their own roots, beginning to bear, and I also had five trees of the Haas topworked that began to bear about the same time. Last year every single one of those Haas trees on their own roots was dead and gone, but the topworked trees are still there and bear fruit. A Fameuse tree that Uncle Wilcox gave me fifteen years ago is still bearing; it was topworked. There is abundant evidence that we can increase the life of a tree by topworking. As Mr. Owen said last night, people will not pay much attention to what you say. If a man should come down to my orchard, as Mr. Sampson and Mr. Gould did, and see the evidence in favor of topworking, he would make up his mind there was something in it.

Mr. Pearce: Did you ever investigate the effect that top-grafting had on the roots?

Mr. Philips: No, I have not; my observations have been on the tops that are in sight and fill the barrels.

Mr. Pearce: Do you believe where you cut a limb off your graft, new roots come out and the old roots die?

Mr. Philips: I don't know anything about that.

Mr. Harris: Week before last I dug up a Russian apple tree that I had purchased from Mr. Budd twelve to fifteen years ago, and there was a dead limb on that tree, and I found the root of that tree under that dead limb was dead clear up to the trunk of the tree. That root was one and one-half inches in diameter and was dead. I suppose all the roots were dead, but the root that was right under the limb, right exactly under the limb I cut off, was clear dead and beginning to decay.

Mr. Pearce: I have found this to be a fact, that the best trees I have in my orchard are trees that have been mutilated.

Mr. Richardson: I cut off the limb of a tree about two years ago because it was in my way. The wound was healing over nicely, but the root was dead to the trunk of the tree.

Mr. Pearce: I was with Mr. Harris some years ago, and on every tree he had topworked we found every root dead six inches below the ground. Every time you put a graft in the tree, if one limb is grafted the lower part dies and new roots must put out. If you graft the whole tree, all the roots die and new ones put out. Now I quit it. I have some samples of trees here that I have grafted, and I never lose a root. If you wish to see them, I will pass them around and let you examine them.

Mr. Wm. Somerville: That is not my experience. I hardly can agree with Mr. Pearce that it will kill a tree to cut the top off, because I have grafted trees, that is, stumps, where I cut the whole top off, and where the stump was three or four inches in diameter, and those trees are as good trees as I have got on my place, and they have been grafted in that form. I have cut the whole top off, and I have put in as many as six or eight scions in the top of that stump, and if they grew I would leave all grow the first summer, and then I would cut one by one off, until I would leave but one of those scions to grow, and I would put those others down to receive the sap so that I would not have a dead place on the side of the stump. In my orchard I can show you a number of trees where I have cut the whole top off and stuck them full of scions, and they are just as good as any other tree.

Mr. Philips: Is that Malinda tree that bore the twenty-five bushels grafted in that way?

Mr. Somerville: Yes, that is grafted right on the stump. I have a number of trees in my orchard in the same fix. It certainly did not kill the roots, or they never could have lived. I do not like to think that of the trunk, and if I had done that, according to Mr. Pearce and Mr. Harris, the tree would have died. Let me tell you some more. Some fourteen years ago, I had some Transcendent crab trees, and they branched down near the ground, and one side fell right off and split down to the ground. I let it lay until the next spring, and I told my men I wanted that thing up, we would raise it up. We raised it up and I tied the tree together with a chain at the top, and I set a scion right in one side of the tree and run it up to the other side and let it stay there two years, and by that time it had taken a pretty good hold, and I am right sure it is now all of five inches across, and now no one could pull the tree apart. In my orchard I take a sprout across and put it on the other side. Have you ever tried that, Prof. Hansen? I have a number of trees large and small, and when I find a water sprout coming out of one trunk I take my knife and put it right across on the other side, and it holds together there in very fine shape. It was a new thing for me when I first tried it. I had never seen the like, and I was going to see how it would do. I followed it with all my trees and have them tied together in that form.

Mr. Brackett: Didn't new bark come in the split of the fork?

Mr. Somerville: It is as solid there now as in any other part of the tree. You would have to look pretty sharp to find it now. I have others as large as my arm that have been put in since then.

Mr. S. D. Richardson: Did the split at the bottom of the tree ever heal over?

Mr. Somerville: Oh, yes; you cannot tell that there was ever anything the matter with that tree. For fear that I might leave a wrong impression here today in regard to what I said yesterday of the number of bushels of apples that grew on my place, I wish to explain my statement. I said we raised 1,500 bushels. That is, if they had all matured, but there were lots knocked off. I did not sell that many this year. Some storms we had blew them off immature. We did not get one-half that number of bushels of ripe apples. Thus, whether I intended it or not,

I thought it might leave a wrong impression, that I sold so many bushels of apples.

Pres. Underwood: Are there any other questions on this topic?

Mr. Wedge: What time of the year should this topworking be done?

Mr. Pearce: It should be done in the spring when the growth keeps right along. Topworking can be done from early spring until June.

Mr. Philips: I use the Virginia crab—I like to have about four limbs for a head; I prefer that to more. I bud the trees in August, and then in the spring I examine them, and usually sixty per cent of them live. I leave them until they grow a little, and then I cut the limbs off. The bud takes possession, and in the fall it will heal over.

Pres. Underwood: You prefer to bud the limbs rather than the body?

Mr. Philips: Yes, I prefer to work in the limbs rather than in the body. The point in topworking the Virginia crab is to have a horizontal limb; then the tree will not split down.

Mr. Brackett: You bud instead of graft?

Mr. Philips: I bud as many as I graft. I did do some whip grafting, but I do not get as good and thrifty a growth as by a cleft graft.

Pres. Underwood: What is the Virginia crab?

Mr. Philips: I guess you have asked me a question I cannot answer. I think the first man who introduced it here was Mr. Grimes. I was at Mr. Lord's ten years ago, and we were talking about topworking. He said he had a letter on topworking from N. K. Fluke, of Iowa, and he read the letter to me, and I could not have better expressed my views on the subject than he did in that letter on topworking. It is about fifteen years ago since I commenced topworking the Virginia, and I have followed it up. Mr. Pearce says he has given it up. I am more impressed with its value than I ever was. I do not know of any way in which I can leave my boys a better orchard.

Col. Stevens: The Virginia crab was introduced into Minnesota from Illinois, and into Illinois from Virginia. It was brought from Virginia about forty years ago. I have a history of the tree; I think it was published. It was not a wild crab tree by any means. It was a seedling of an apple, not a crab, that grew in the hilly country of Virginia.

Mr. Philips: Prof. Budd thinks it is the wild crab of Russia.

Mr. A. F. Collman: A few years ago I brought some Virginia crab trees, and I planted 700 in my orchard which I expected to topwork, and I felt as though I had an elephant on my hands, but when I saw Mr. Philips was on your program I knew I would be much interested in what he had to say about topworking. Mr. Philips has had a good deal of experience. I do not believe in healing over a wound. I do not think it pays to get the bark to cover a wound, because where there is a dead spot in the body it will decay. I think if Mr. Somerville would saw his tree in two, he would find there was a dead spot there and very little sap wood. We know in cleft grafting you can split the tree and insert a graft and let a little air in there. Now it is a question whether it will heal up perfectly sound, and I have not practiced it, because I have some doubts about grafting that way; so I have adopted a new way. I side graft. I take a good, sharp knife and cut into the bark, make a little wedge scion and put it in slanting. I make it on the upper side of the limb, next year I can cut off the limb, and that makes a perfect union. I would like to know if Mr. Philips ever practiced that?

Mr. Philips: Speaking about healing over, if I have a horse cut on a wire fence I want that wound to heal over. That same question was raised last summer by a man. He also did not believe there was a perfect union. I told him I had a number of those topworked trees, and I would cut one to satisfy him. I cut one in two, and it was as perfectly solid where that graft was put in as it could be. The air had been excluded and the wound had healed over perfectly. You cut a limb off slanting on the under side and there is no chance for air to get in, and no chance for decay. I have practiced the other way a little, but I like my own way better, and I can do it faster. I have no objection to side grafting at all. You put it on the top of the limb, and it gives a nice union.

Mr. Harris: That side grafting is the best way for plums.

Mr. Collman: A year ago last March I topworked a plum scion on one I knew was perfectly good, and it made a growth of five inches that season and matured eight plums on that little twig.

Prof. N. E. Hansen: Don't you think budding is the best way to topwork the Virginia?

Mr. Philips: Well, yes; I do. I am sixty years old, and I want to see all the good done I can. I put the buds in in the fall and graft the next spring to change them as soon as possible.

If I was young I would practice budding altogether. If I were a young man, from fifteen to twenty years old I would start an orchard on those lines.

Mr. Theilmann: When I was a young boy in the old country, I also learned topgrafting. The question comes up here about this topgrafting and healing up sound and solid. That seems to be the question before the house now. I grafted trees in the old country, where I put in 150 scions on one tree, and I have grafted hundreds of trees where I put in from 25 to 150 limbs. All the people that come over tell me that those trees are all sound and bearing very heavy every year. So they must be sound, or else they would not bear. I split limbs and put in my grafts. As far as my knowledge is concerned, that would settle the question, but whether the climate here would be so well adapted to the trees as the climate where I came from, I do not know.

Mr. Wedge: I would like to ask Prof. Hansen if he saw the Virginia crab in Russia?

Prof. Hansen: I saw a good many there, but I am unable to say if it was the same. I did not examine closely enough for that.

Mr. Pearce: I do not wish to take up any time. The roots are the foundation of all fruit trees. Every fruit tree has got to have three classes of roots. In the first place, there are the feeders, then the secondary roots, and third the tap roots. If the ground is suitable they go down deep. And there is but one cut of the root that is fit to graft. That is the first cut. That contains all the elements that go to make a perfect tree. Anything below that will be abnormal, and the roots will be mixed together and all inferior. Here is a double-worked tree (showing a specimen). I have been in the business eight years, and I know a little something about it. That tree will stand drouth. Last season it was very dry, and they made a wonderful growth.

Mr. Kimball: In setting out topworked stock, do you set them out as whip stocks, or wait until they throw out two or three limbs?

Mr. Philips: I wait until they throw out limbs.

Mr. Kimball: The whip stocks do not give as good results?

Mr. Philips: Not in my experience.

Mr. Kimball: Did you ever find any trouble with rust in the Virginia?

Mr. Philips: I never have.

Mr. Kimball: Mr. Cotta, of Illinois, told me he had discarded the Virginia.

Mr. Philips: Mr. Phoenix wrote to me he had discarded it because of blight. He used the Shield's crab. I asked him how long either of them had been bearing. I thought I could learn something. I found he had never fruited an apple on either of those stocks, so I concluded my experience was worth more than his. The Virginia is good enough for me.

Mr. Smith: I got a letter from parties down there giving the same recommendation for the Shield's as he had. I got five hundred, and I do not want any more. They blighted as bad as the Transcendent. They were not a vigorous grower.

Pres. Underwood: Would it not be a better way for the nurserymen to set out the Virginia crab and get them started?

Mr. Philips: That is the way; buy your Virginia crabs of the nurserymen, and then you can bud them to suit yourselves.

Mr. Kimball: You take the rank and file, and the question is to get it before the people. Topworking trees is all right, but how are we going to get the people to take advantage of it? It is an easy matter to topwork or graft, but how are the people going to know how to do it?

Mr. Philips: I said when I commenced, it is a hard subject to get before the people. I show a man my trees and tell him just how the thing is done, and the chances are he'll say, "I would not go to all that trouble; I would rather buy my apples." There is no way of getting it before the people, if they don't care to know anything about it.

Mr. C. L. Smith: The way to get this before the people, to get them interested in horticulture, is to write it up and spread it before them through the public press. This matter came up last winter, and I had a short sketch in the paper, and I got a number of inquiries from farmers' boys who wanted to know something about grafting, and at an expense of a few cents I sent them a few grafts and buddings to show them how it was done, and they did some grafting, and I have reports from four boys in Minnesota who did successful grafting, and if we do a little work in that direction we can get it before the people. We must agree on what is the proper thing to do; if one says this, and another says that, our instruction will fall flat. If we agree on what is the right thing and then spread it before the people through the public press, we will accomplish some good, because the boys in Minnesota are taking an interest in horti-

culture; and if we answer that question intelligently, we shall soon have them doing good grafting.

Mrs. Kennedy: One of the best ways to get it before the public would be at the institutes; have a little grafting done there. That is where our boys all go, they go to those institutes, and if they could have twenty minutes or half an hour's instruction, they could learn more in that time than by all the reading they could do in the public press. An object lesson of twenty minutes would do more good than any amount of reading.

Mr. Kimball: As I said before, the question is, getting it before the people. I think we must send out reading matter to the people and educate them as fast as we can. I would like to assist the rank and file to a more hardy and better tree.

Pres. Underwood: We do not want to keep the same ones talking all the time, and I would be glad to give an opportunity to those who have not spoken on this subject.

Mr. G. J. Kellogg: The Shield's makes the nicest tree. The Virginia is good, but I prefer the Shield's. In answer to Mrs. Kennedy's suggestion, I would not ask the conductor's permission to show the boys how to graft; I would do it without his permission.

Pres. Underwood: I think Mrs. Kennedy's suggestion is most practical, and I hope Mr. Wedge will follow her suggestion and make an opportunity for educating the people of our state in this matter.

Mr. Wedge: I am very glad to get these suggestions, and am glad that you feel free in giving them to me, but the way our institutes are conducted it is not always possible to follow out the suggestions. At some time when it is convenient, I would like four or five minutes time to say a few words in regard to my experience on the institute corps, and to ask some questions.

IMPROVING THE LAWN.

In looking over the lawn in the early spring, one is likely to find little hills and hollows that greatly mar its beauty. Places not over an inch or two below the level may have sufficient soil put on to even them up, and the grass will readily come through.

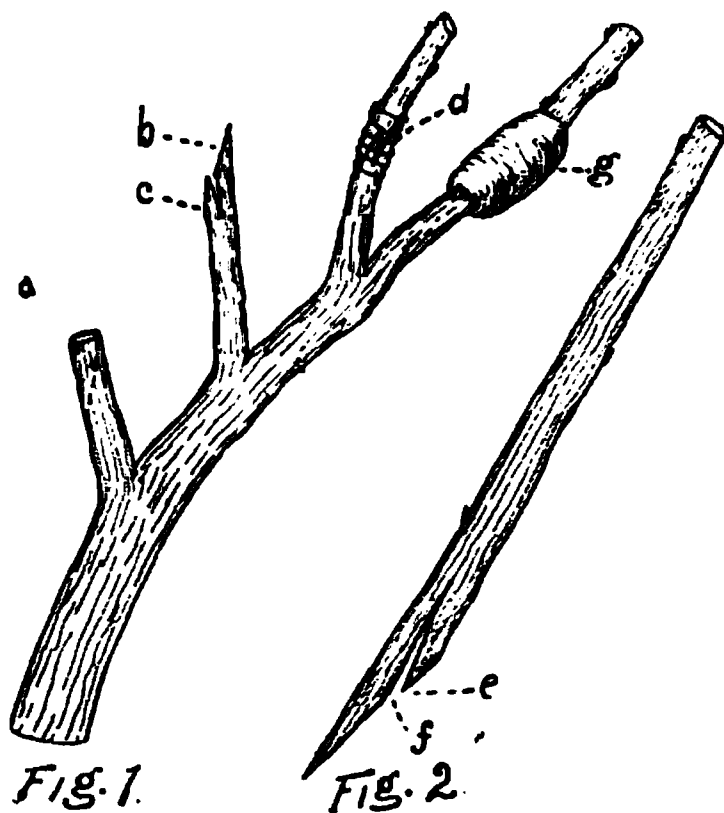
Where a deeper filling is required, the sod must be taken up, rolled to one side and soil put in to bring it to a level. The sod is then to be rolled back to its place and pounded down with the back of the spade. Where the soil is too high, the sod is to be taken off, the surplus earth removed, and then the sod is put in place as above. An inexperienced person will be surprised to see what a little labor will accomplish.

GRAFTING, CONTINUED.

J. S. HARRIS, LA CRESCENT.

Last month we treated of whip-grafting as practiced in the propagation of nursery trees by root-grafting on yearling seedling stocks. It is at the same time the simplest and best of all methods of topgrafting young orchard trees in the branches or the trunks where the place for inserting the graft is less than one-half inch in diameter.

For grafting in the top of small trees, select a branch of suitable size and cut it off at the point where it appears best to fix the graft (a, fig. 1);

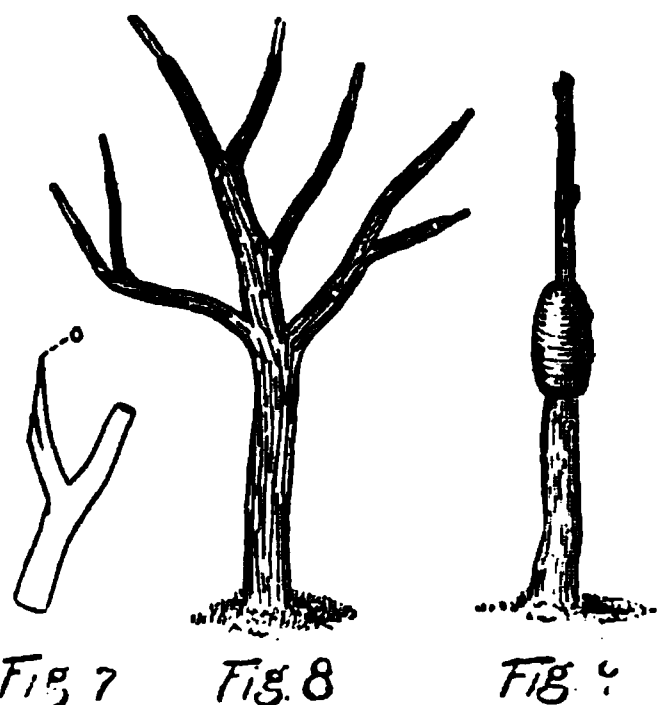


then, with a sharp, thin knife, make a diagonal cut beginning from an inch to an inch and a half below according to size of stock and scion and extending to the end (b, fig. 1); next make a slit in this cut extending from the center downward one-half an inch or more (c, fig. 1). Cut the scion (fig. 2) so as to have about three buds; then shape the lower end with a smooth, sloping cut about the same length as on the stock, and cut a tongue (f, fig. 2) upward so that it will fit in the downward slit (c, fig. 1) of stock. Now put the scion and stock together, interlocking the tongues

(d, fig. 1) and pressing them firmly together, making the inner bark of the scion and stock exactly fit, at least on one side. Next carefully wind about them some cotton or woollen yarn to hold them in place, and cover the place of union with grafting wax (g, fig. 1) or, if they are wrapped with a narrow strip of waxed cloth, as with root-grafts, the tying with yarn will not be necessary. The operation is done exactly the same whether done on the trunk of a small tree or on the limbs of a large one, as shown in figs. 7, 8 and 9. For this climate, the trees operated on should be of undoubted hardiness and in thrifty condition.

CLEFT-GRAFTING.

Cleft-grafting is as easy but a more clumsy method than whip, or tongue, grafting, but the cut end of the stock never knits with the center part of the wood above and literally remains dead wood. The union of the two takes place in the inner bark, and, although subsequent growth spreads out and covers the wound, the union is comparatively weak, and decay is liable to begin before it is accomplished; hence, in this climate this method should not be practiced, except on trees or branches that have become too large for working by the other method.



Tools. In addition to a sharp knife for preparing the scions, a fine saw with the teeth set rather wide will be needed for taking off the limbs; a chisel grafting knife or strong butcher knife will answer for splitting the limb; a mallet and wooden or iron wedge for opening the cleft will also be needed. The practical operation consists in first sawing off the limb or trunk at the front where the graft is desired; if on a limb, usually leaving about six inches below to the point where it joins on to the tree (a, fig. 14), choosing a smooth,



Fig. 14.

Fig. 14.

straight part and smoothing the edges over with a sharp knife. Second, place the chisel or knife across the end of the butt and with a few moderate blows of the mallet split it to the extent of an inch or or two (b, fig. 14). A scion is prepared by cutting its lower part to the shape of a long wedge (fig. 15), taking care to have a bud (b, fig. 15) at the base of the scion above the wedge. It is customary to make the edge of the wedge opposite

to this bud slightly thinner than the other. Next spring open the cleft sufficiently to receive the scions by driving the wooden wedge in the center, when the scion is inserted with the bud b outward. The inner bark of the scion and stock must exactly meet, as in other methods of grafting. The opening wedge is now withdrawn, and the scions are held quite firmly in place (c, fig. 14). The whole wounded portion must now be covered with grafting wax (d, fig. 14), and over that it is well to wrap waxed cloth. It is customary to insert two scions in stocks that are an inch or more in diameter, one to be cut away afterward if both live. When small stocks are cleft-grafted, ranging from one-half to one and one-fourth inches in diameter, it is better to make a sloping cut on one side of the stock, beginning an inch to an inch and a half below and cutting up to the center, as shown at a, fig. 16; then split the stock just at one side of the pith (b, fig. 16) and hold the cleft open with a knife or chisel until the scion is inserted with the lower bud outside and just at the top of the cleft, and wax or wrap with waxed cloth (a, fig. 17). But one scion is required, and the wound heals over and makes a better union than when two scions are set in one stock.



Fig. 16.



Fig. 17.

The renewal, or topworking, of a tree of any considerable size should not all be done at once but should extend over two or three seasons. Beginning with the upper part is most usually recommended, but we prefer working the lower branch first. Where a tree is entirely worked over in one year, it is best to leave some of the original top to act as a safety valve and prune it away gradually afterwards.

NOTES FROM THE FARMERS' INSTITUTE.

CLARENCE WEDGE, LECTURER ON HORTICULTURE,
ALBERT LEA.

We suspect that there is beginning to be a wearisome sameness in these reports, and that our members have had about enough of measurements of apple trees and reports on blight, drouth and sunscald. But we trust that the names of parties interested and more or less successful in our art and some report of their progress in the different sections of the state may prove of value, at least for future reference and encouragement. While at Shakopee, we had the pleasure of spending the night with Osburn Cummins, of Washburn, who is particularly interested in trying to grow some of the half-hardy fruits by bending them to the ground and covering with litter. He also has some of the Russian and other apples on trial. Although on elevated ground, the subsoil is of a dry, gravelly character, and the apple trees show the want of a congenial soil, though given excellent care, by their lack of thrift and vigor and inclination to weakness and disease. We noted the Hibernial and the Bode, bearing trees, looking as well as any. Mr. Cummins is devoting much intelligent care and thought and not a little enthusiasm to his fruit garden and orchard, and our society should keep in close touch with his work.

While at New Ulm, in company with Martin Penning and C. W. H. Heideman, we visited the orchard of H. C. Miller, about one mile east of New Ulm, considered one of the best in that section. We found the orchard on an east slope well up on the brow of the bluff overlooking the Minnesota. The trees have held on well, and are simply dying from lack of moisture and consequent loss of thrift, finishing their career with sunscald and general decay. We noted Duchess of thirty-three inches girth, Whitney very perfect, twenty-eight inches, Minnesota crab in good condition. The orchard is not cultivated and presents a very dilapidated appearance.

Within the limits of the city, we visited Chas. Wagoner's place, where we found a Duchess tree thirty-three inches, in perfect condition, that two years ago bore twelve to thirteen bushels of apples; also a fine Minnesota, twenty-four inches, not as yet a heavy bearer but in very perfect health. These fine trees have nothing favorable in their environment but are in the midst of a garden and in a soil that seems to have a reasonable degree of moisture, as is evidenced by a fine thrifty plum grove near by, and by the bright healthy green of the evergreens about the place.

Mr. H. Knudson's place, at Springfield, abounded in interesting young trees in great variety. We noted that he had several seedlings already started from his now famous Hybrid Sand Cherry, showing that the cross was not violent enough to render it sterile. He has also the seed from other crosses planted, and hopes for still more of value for our climate. Mr. K. speaks of the quality of his hybrid, now named "Compass," in the highest terms, and we hope his labors may be rewarded both by a general recognition of his work and by a satisfactory pecuniary compensation.

In the prairie sections of the state, the groves that have become established are very generally used as pastures for stock of different

kinds and are suffering from this unwise and unnatural treatment. We have earnestly recommended that every hoof be kept out of the groves and shelter trees, but have been somewhat in doubt as to the injury that the hog might do. While at Pipestone, we were very glad to learn the experience of Mr. A. E. Gilmore on this point. He had enclosed a portion of his fine grove of box elder and ash with his hog pasture, and had observed during the past season that the foliage of the portion so pastured had a distinctly yellow and poor look in comparison with the rest of the grove.

REPORT ON SEEDLINGS, APRIL 1, 1896.

J. S. HARRIS.

BUTTERMORE'S SEEDLING APPLE.

At the late meeting of the State Horticultural Society held in Minneapolis, a fine plate of seedling apples was exhibited by Robert H. Buttermore, of Lake City, Minn. We learn from Mr. B., that the tree producing them is about twenty-four years old and has been bearing fifteen or sixteen years and, he thinks, has not missed a single crop in that time. On years when he has had but few Duchess or other kinds, this seedling has produced good crops of nice fruit. It has never shown any blight, and he considers it the hardiest tree on his place. It was not affected by the frosts of the last two years like his other hardy varieties. I examined a specimen of the apples about the 20th of February. The size was (6), or large medium; form roundish oblate; color green, overspread with thin brownish red with a few brighter red splashes on the sun side; stem short, medium elastic, set in a broad, medium deep cavity, greenish russeted at the bottom; calyx closed, in a broad, medium deep, irregularly wrinkled basin; flesh yellowish green, nearly fine; flavor pleasant acid; core small and closed; season, probably January to March. The buds and young wood do not show the slightest injury or discoloration from the last winter.

THE OKABENA APPLE.

I received a box of specimens of the above variety from President Underwood on March 12th that were in fine condition. He writes that they were picked and put into cold storage for a time, but for the last three months were kept in boxes in a dry cellar. The Okabena is one of our most beautiful apples. Size, from medium to large; form smooth, oblate; color yellowish green, pinky and crimson in stripes and splashes; core small; flesh yellowish white, fine; flavor pleasant, sub-acid. The tree is a strong symmetrical grower. Origin, Worthington, Minn., from seed procured of Peter M. Gideon, of Excelsior.

NATIVE PLUM, BRITTLEWOOD NO. 1.

We learn from the originator, Theo. Williams, Bensen, Neb., that the Brittlewood plum mentioned on page 380, magazine for October, 1895, is a pure *P. Americana*, and hence it ought to prove hardy over the whole Northwest. He has never propagated the variety for sale. He writes that he has some other seedlings and some hybrids that promise to be very valuable, and promised to furnish samples of the fruit in its season.

From American Gardening, issue of Feb. 22, 1896.

KITCHEN GARDEN PLANTING TABLE.

A guide to the proper times for sowing of various seeds in order to obtain a continuous succession of crops.

VEGETABLES IN THE KITCHEN GARDEN.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Explanation of Signs Used in the Table.
Artichoke, American..	●	●	<p>● To be sown in open ground without transplanting. Plants have to be thinned out, and given proper distance.</p> <p>1. Sow on seed bed in the garden, and transplant thence to permanent place.</p> <p>2. Make two sowings in open ground during the month.</p> <p>3. Make three sowings in open ground during the month.</p> <p>4. Start in greenhouse or hot-bed, and plant out as soon as the ground is in good shape, and weather permits.</p> <p>5. Sow in open ground as soon as it can be worked.</p> <p>6. To be grown only in hot-bed or greenhouse.</p> <p>7. Sow in cold frame, keep plants there over winter with a little protection; plant out in spring as soon as the ground can be worked.</p> <p>8. To be sown in open ground and protected with litter over winter.</p> <p>9. Plant in frame. When cold weather sets in, cover with sash and straw mats. Plants will be ready for use in December and January.</p> <p>10. Plant in cellar, barn or under benches in greenhouse.</p> <p>11. Plant outdoors on prepared beds.</p> <p>12. Sow every week in greenhouse or frame, to have a good succession.</p>
" , French.....	.....	4	.....	1	1	.....	.....	.....	.....	.....	.....	.....
Asparagus .....	.....	.....	5	●	2	2	2	●	.....	.....	.....	.....
Beans, Bush.	6	6	6	●	2	2	2	●	.....	.....	.....	.....
" , Pole and Lima..	.....	.....	4	4	●	●	●	.....	.....	.....	.....	.....
Beets .....	.....	.....	4	4	●	1	1	●	.....	.....	.....	.....
Borecole, Kale.....	.....	4	4	1	1	1	1	.....	7	7	.....	.....
Broccoli.....	.....	4	4	1	1	1	1	.....	7	7	.....	.....
Brussels Sprouts.....	.....	4	4	1	1	1	1	.....	7	7	.....	.....
Cabbage, all sorts.....	.....	4	4	1	1	1	1	.....	7	7	.....	.....
Cardoon.....	.....	4	4	1	1	1	1	.....	.....	.....	.....	.....
Carrot.....	6	6	5	●	●	●	●	.....	.....	.....	.....	.....
Cauliflower.....	6	4	4	1	1	1	1	<p>8. To be sown in open ground and protected with litter over winter.</p> <p>9. Plant in frame. When cold weather sets in, cover with sash and straw mats. Plants will be ready for use in December and January.</p> <p>10. Plant in cellar, barn or under benches in greenhouse.</p> <p>11. Plant outdoors on prepared beds.</p> <p>12. Sow every week in greenhouse or frame, to have a good succession.</p>
Celeriac.....	.....	4	4	1	1	1	1	.....	.....	.....	.....	.....
Celery.....	.....	4	4	1	1	1	1	.....	.....	.....	.....	.....
Chicory.....	.....	.....	5	●	●	●	●	.....	.....	.....	.....	.....
Collards.....	.....	.....	.....	●	●	●	●	.....	.....	.....	.....	.....
Corn, Field.....	.....	.....	.....	2	2	2	2	.....	.....	.....	.....	.....
" , Sweet.....	.....	.....	.....	2	2	2	2	.....	.....	.....	.....	.....
" , Pop.....	.....	.....	.....	2	2	2	2	.....	.....	.....	.....	.....
" , Salad.....	.....	.....	5	●	●	●	●	.....	8	.....	.....	.....
Cress.....	12	12	12	12	●	●	●	.....	12	12	12	12
Cucumber.....	6	6	6	4	●	●	●	6	6	.....	.....	.....
Egg Plants.....	.....	6	4	1	1	1	1	.....	.....	.....	.....	.....
Endive.....	.....	.....	.....	1	1	1	1	.....	.....	.....	.....	.....
Kohlrabi.....	6	6	4	1	1	1	1	.....	.....	.....	.....	.....
Leek.....	.....	4	4	1	1	1	1	.....	.....	.....	.....	.....
Lettuce.....	6	4	4	1	2	2	2	.....	9	9	7	.....
Mangel.....	.....	.....	5	4	●	●	●	.....	.....	.....	.....	.....
Melon.....	6	6	5	4	●	●	9	.....	.....	.....	.....	.....
Mushroom.....	10	10	11	.....	.....	.....	.....	11	10	10	10	10
Mustard.....	12	12	12	●	●	●	.....	●	●	12	12	12
Nasturtium..	.....	.....	4	4	2	2	2	.....	.....	.....	.....	.....
Okra.....	.....	4	4	1	1	2	2	.....	.....	.....	.....	.....
Onion .....	.....	4	4	1	1	1	1	.....	.....	.....	.....	.....
Parsnips.....	.....	.....	5	●	●	●	●	.....	.....	.....	.....	.....
Parsley.....	6	6	4	●	2	2	2	.....	.....	.....	.....	.....
Peas.....	.....	.....	5	2	2	2	2	.....	.....	.....	.....	.....
Pepper.....	.....	4	4	4	1	.....	.....	.....	.....	.....	.....	.....
Potatoes.....	.....	.....	.....	4	●	●	.....	.....	.....	.....	.....	.....
Pumpkin.	12	12	12	4	3	3	3	.....	.....	.....	.....	.....
Radish.....	12	12	12	3	3	3	3	.....	9	9	.....	.....
Rutabaga.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salsify.....	.....	.....	5	●	.....	.....	.....	.....	.....	.....	.....	.....
Seakale.....	.....	.....	5	●	.....	.....	.....	.....	.....	.....	.....	.....
Spinach.....	.....	.....	5	4	.....	.....	.....	.....	2	8	.....	.....
Squash.....	.....	.....	4	1	.....	.....	.....	.....	.....	.....	.....	.....
Tomato.....	6	6	4	1	1	1	.....	6	6	6	.....	.....
Turnips.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

N. B.—For last planting of Beans, Sweet Corn, Kohlrabi, Peas and Radishes or even Tomatoes, take the earliest varieties, just the same as are used for first planting.

The late sowings of Salsify are intended to remain undisturbed over winter. Roots from these sowings will, the next year, attain a size double that usually seen.

This table, printed on cardboard, ready for hanging, can be obtained from the office of Publication. Price, postpaid, Five cents.

WISCONSIN STATE HORTICULTURAL SOCIETY, ANNUAL MEETING, FEBRUARY, 1896.

E. H. S. DARTT, OWATONNA, DELEGATE.

It afforded me great pleasure to attend the annual winter meeting of the Wisconsin State Horticultural Society as your representative, and to meet again the friends of long ago. The meeting was held in the senate chamber at the capitol and was well attended. Mr. A. J. Swezey, of Rockford, Ill., and Mr. M. E. Hinkley, of Marcus, Iowa, were admitted as delegates, and Mr. C. G. Patton, of Charles City, Iowa, attended as a visitor. The delegates present, together with Mr. Patton, were made honorary life members of the society, an honor which was highly appreciated.

Valuable papers were read, but they were not too lengthy or too numerous to shut out full discussion, that great renovator of musty theories.

Provisions were made for issuing the annual report in monthly installments, to which will be added each month a few pages of general horticultural news.

A resolution was adopted in favor of memorializing the State Agricultural Society not to allow the sale of intoxicating liquors on the state fair grounds during the coming year.

An experimental orchard has been established at Wausau, near the center of the state and about 600 feet above Lake Michigan; it is to be under the control of the Wisconsin State Horticultural Society. It contains ten acres of land, five acres of which will be used for general trial purposes, and the other five acres as a commercial orchard. A committee, on which were J. C. Plumb and Geo. J. Kellogg, two of the oldest and best informed horticulturists of the state, recommended the following varieties: for the trial orchard, six of a kind, Tetofsky, Yellow Transparent, Duchess, Barloff, Glass Green, Hibernial, Antonovka, Longfield, Switzer, Wealthy, N. W. Greening, Windsor, Patton's Greening, Wolf River, Newell, McMahon, Haas and Scott's Winter; for the commercial orchard, ten to twenty trees of a kind at one planting, Duchess, McMahon, Hibernial, Newell, N. W. Greening, Scott's Winter, Wealthy and Patton's Greening. Stock will be contributed by nurserymen and others, and the trial orchard will soon be filled to overflowing with varieties boomed and un-boomed from their own and other states. Here will be a fair test and an impartial report, so that true merit will win, and people who take the trouble to inform themselves need not be humbugged with unreliable varieties sold by unreliable men.

I took great pleasure in visiting the state experiment station, where I found Prof. Goff with his hands more than full. Many students must be finished off, both' practically and scientifically, requiring various experiments and a vast amount of labor. In the greenhouse, he is testing sub-irrigation. Water tight pans cover the bottom of the beds. On the bottoms of the pans, slats are placed, and on the slats bricks, and over the bricks several inches of soil. Water is run into the pans until it touches the bricks, and is then drawn up to the surface by capillary attraction. The advantages of this method are that plants receive a constant supply of moisture,

and the ground is less likely to pack than when water is applied to the surface.

He saved his strawberries from the late spring frosts which nearly ruined the fruit crop over the entire state by a timely covering of old hay, and he saved them from drouth by irrigation. His crop was bountiful and of fine quality, while on unirrigated land it was almost a total failure. The variety most used was Warfield fertilized with Wilson. It is his opinion that in very dry seasons like the last it is useless to attempt to grow strawberries without irrigation. His orchard is young, and the trees made but feeble growth last season. The first orchard was of Eastern varieties placed on a southern slope, and soon died out. The second was of better varieties, was placed on a northern slope and did well, but the land was used for other purposes. The third and, I suppose, last is on a northern slope, or hillside, not too steep for cultivation, but it was thought that if it were kept well cultivated it would wash badly, and for this reason it is seeded down. A little digging is done about the trees, and the whole surface is mulched. It has never been my fortune to see a young orchard doing well under such conditions, yet the professor may be able to prove what many believe, that a moderate growth is preferable to a rapid one. He has many varieties of apples, plums and pears, and as the trees come into bearing his reports must become very valuable.

In blackberry culture, trouble is found in laying down old plants on account of the large size of the roots. Some were exhibited two or three inches in diameter. A man in Sheboygan county, on heavy clay soil, has raised fair crops without covering. The best varieties are the Ancient Briton and the Badger, which is supposed to be a seedling of the Ancient Briton. A paper on pear culture showed that at least one pear orchard in Racine county had paid well. Pears are said to be doing well along the lake shore as far inland as the lake influence extends, which is thought to be twenty-five miles. In some instances the pear is doing fairly well top-grafted on the apple and mountain ash, but the stock recommended in the paper is the imported Japan seedling.

In visiting my old home in Green Lake county, I found a few straggling, or, I might say, struggling, old trees, marking the spots where fine productive orchards stood twenty years ago. In my opinion, trees have mostly died from starvation. I think a productive tree fifteen years old, on ordinary soil, should have at least one-fourth of a wagon load of stable manure applied as winter mulch each year. Although this treatment might not make trees very long lived, yet it would tend in that direction and would improve the fruit in quantity and quality. The farm orchard seems to be disappearing, and the commercial orchard is taking its place. This is right, for in things difficult specialists are most likely to succeed.

A firm in Ripon, in which L. G. Kellogg, president of the Wisconsin Horticultural Society, is conspicuous, is starting a large fruit farm on high grounds near Green Lake. Sixty acres will be planted the coming spring, sixty acres the following spring and twenty acres each spring thereafter. They will plant apples, pears, plums and cherries. A man near Ripon, planted 3,000 Duchess two years ago, and, if other sections are doing as well, Wisconsin will soon be well towards the front in fruit production.

When we can fully understand the language of the trees and kindly minister to all their wants, then apples, pears and plums will abound in Wisconsin and Minnesota. For kindness liberally bestowed on men, animals and trees, *always was and always will be a paying investment.*

April Calendar.

J. S. HARRIS.

Be ready at the first opening of spring to do every kind of work promptly and in season.

All trees and shrubs should be transplanted, if possible, before the trees put out or the buds are very much started, but not in wet soil or that which is partly frozen. Currants, gooseberries, raspberries and some of the ornamental shrubs start very early and should be planted as early as the season will permit.

It is in order to refer to the calendar for March, and if any of the suggestions have been overlooked or not put in practice to at once attend to them. Two or three more drying, windy days might effectually kill a rabbit gnawed tree, that would recover if the wounds were waxed over or banked over with soil immediately. Orchard insects are largely bred in diseased limbs and dead trees and fruit of the lowest grade and poorest quality. Diseased limbs and dead or dying trees should at once be removed from the orchard, and any trees that bear fruit that is not worth gathering for use should, if hardy and healthy, be worked over, or top-grafted, to something good and valuable; if tender and diseased, they had better be removed and their places filled with something better.

It is well to remember that good health is the preservative of life, and that good nourishing food is the key to health. Do not fail to feed (manure) the orchard, that it may enjoy good health, be fruitful and live long on the land in which it is planted.

If trees are received from the nursery this spring, they should be unpacked and carefully heeled in immediately; at no time should the roots be exposed to the wind and sun; and when taken to the field for planting they should be kept covered with blankets or damp burlap sacking. Let the holes be dug amply large to receive all the roots in their natural position. Before setting, examine each tree for borers and destroy any that are found, and, if badly infested, better discard it. Smooth the ends of the mutilated roots with a sharp knife, cutting them from the under side and outward, and cut the tops back enough to correspond with the loss of roots, and set as expeditiously as it can be done well. The process of granulation and making new roots will take place more readily from a new cut brought into immediate contact with the soil than from an old dry wound.

Root-grafts and other nursery stock do much better for being put out early, but not before hard frosts are past. Cuttings of currants and gooseberries require to be put in early, but grapes may better be delayed until the last of the month.

Grafting is now in order (See article on another page).

New strawberry beds may be made as early as the ground is ready, and most frequently the early setting does the best in vegetables.

Raspberries, blackberries and grapes that were buried in the soil or covered with earth during the winter, should be examined once a week or oftener. If the buds are swelling, remove the soil and get the canes out before they start into growth.

In the kitchen garden the hotbeds and cold frames should be carefully attended to, giving water and air whenever needed, and asparagus, beets, cabbage, cauliflower, celery, lettuce, parsnip, peas, radish and spinach seed may all be safely sown in warm borders as early as the ground can be got ready, but the tender varieties will not do out before about next month, but such as bear transplanting should be sown in hotbeds or cold frames.

Your Corner.

THE MINNESOTA HORTICULTURIST is very interesting and helpful to us and is a welcome visitor to our home.

Lake City, March 11th, 1896.

R. N. BUTTERMORE.

"The last 'Notes from the Farmers' Institute' had two errors, which I wish you would correct. \$100 worth of Turners were sold from $\frac{1}{4}$ of an acre, instead of $\frac{1}{8}$; and it was our old friend, M. Cutler, and not Mr. Cutler. I thought many of the old members might like to hear of his whereabouts." (See March number, 1896.)

CLARENCE WEDGE.

"In reading through the HORTICULTURIST for March, and especially Mr. J. S. Harris' article on grafting, we note the absence of reference to raffia as a material for tying buds and grafts. * * * It is certainly the handiest article we have ever had experience with for the purpose. It is always ready for use, needs no preparation at any time before using and is easily kept. It is soft and pliable and is therefore of benefit in handling tender plants. We understand it to be taking the place of the materials we notice mentioned, and it is being adopted by most of the larger growers."

THOMAS MEEHAN & SONS.

Germantown, Phila, March 6, 1896.

In the flower garden, dig the soil only when it is warm and dry and avoid unnecessary tramping over it when saturated with water. Hardy perennial plants should be put out early, and those that have stood three years in one place will do better if the stools are taken up and separated, replacing one-third and giving the balance to your neighbors who have none. Hardy bulbs that were set in the fall and covered through the winter should be examined occasionally and as soon as they show signs of active growth should be uncovered. Finally, in planting fruit and ornamental trees do not make the too common mistakes, viz.: selecting *trees that are too large* and planting them too thickly.

J. S. HARRIS.

I received today from the Lake City Nursery Co., some Okabena apples that from appearance had not been in cold storage. They were fine specimens of fine quality and of marketable size. When we can raise such winter apples as these that will compare favorably with Eastern varieties, both in size and quality, every farmer ought to make an effort at least to raise enough for his own use and some to sell. There will always be a market for such apples. It is true we have had no extremely hard winters for a long time, yet from the ripening of the wood and the general appearance of the tree I hold it as one of our hardiest varieties. The Lake City Co., sent me six of these trees four years ago for experimental purposes. They have proved very satisfactory in growth of wood, and from appearance will fruit this year. They have also sent me

a number of Thompson's seedlings, which have made a vigorous growth; like the Okabena, they are free from blight, but have not fruited yet.

WM. SOMERVILLE.

Viola, Minn., March 11, 1896.

FILLMORE CO. HORTICULTURAL SOCIETY.—We had a good meeting of our society at Spring Valley, February 15th. The weather was cold and stormy, but the attendance was good. The secretary of our State Horticultural Society had kindly sent copies of the monthly "Minnesota Horticulturist" for distribution at the meeting, and the president urged all present to join the parent society so they might regularly receive the magazine. An address by C. F. Gardner, Osage, Iowa, on "The Apple and Irrigation of Small Fruits;" a paper by J. Marshall on "The Farmer's Garden;" and an address by R. C. Livingston on "The Fruit Tree Business" were good and called forth considerable discussion. An addition of ten new members, on such a cold day, surely indicates that our infant society is not easily "winter-killed." A summer meeting will be held at Preston in strawberry time.

R. PARKHILL, Secy.

Chatfield, Feb. 26, 1896.

The Massachusetts State Horticultural Society want to move soon, and propose to sell their hall and the land under it for \$800,000. The financial committee expect to be offered this amount and build a new hall.

* * * * *

In September, 1860, I attended the seventh convention of the Am. Pom. Society, at Philadelphia, with Barry, Wilder, Downing, War-der, Elliott, Thomas, Meehan and a host of others. Of that company, how few remain! It has been my fortune and my boast that I have not failed to be present at a single convention since 1860. This is not so with another horticulturist in America. Thomas Meehan lives yet. He has four or five very active and intelligent sons, active in horticultural pursuits. I have five sons, three of whom are directing the labor of thousands of workers in different landscaping operations.

JACOB M. MANNING.

Reading, Mass., March 17, 1896.

A new Swindle on Fruit Trees in Southwestern Minnesota. As this was a mild winter, it was the winter for the tree agents to work their sham again on the farmers of southwestern Minnesota.

A set of agents were here from Princeton, Ill., claiming they had the right kind of fruit trees for Minnesota. To prove this to the farmers, they get hold of a big sucker of a farmer, tell him that they will furnish the trees and shrubbery and will plant it all themselves, and at the same time plant two rows of Russian mulberry trees around the outside for a windbreak. They agree to do all this and wait three years for these trees to prove they are what they claim. After the three years, if the fruit trees are in a fine and healthy condition, then the farmers will have to pay for the whole stock at the low price mentioned in the contract and seven per cent. interest. The farmer has to cultivate and take care of the trees according to their directions. No note is given. The first deal was

made with a German farmer by the name of August Speckman for the amount of \$80.

The second deal was made to an American farmer by the name of Fred Kromlet, six miles away from the first. The contract was made about the same and for the same amount. The two contracts took well among the farmers, and many were anxious to get an order for such fine trees.

After all this they commenced canvassing. They sold to a number of farmers in this vicinity from \$10 to \$20 each.

Something should or must be done to keep out Southern fruit trees, as it is nothing but a steal from Minnesota.

MARTIN PENNING.

Sleepy Eye, Minn.

I see by reading report of last month on page 87, that I picked over sixteen bushels of apples from one tree of Anisim. This is incorrect. I picked over eleven bushels from one tree that was not over six inches through at the ground. I should like to have this corrected, as eleven bushels is a pretty good gulp and sixteen would never go down.

I would like to know how you tighten your trellis wire. Prof. Green in his book said to bore a hole in one end post and pass the wire through, but don't tell how to make it tight. (Will some one answer this? Sec'y.)

I would advise the orcherdest to be careful and cut off all the water suckers from the bodies and large limbs of their apple trees. I have had many trees injured by not tending to this. The blight generally strikes these soft sprouts the first thing and works down onto the body of the tree and makes a bad place on the tree, and if the tree is small will sometimes work all round it and kill it.

SIDNEY CORP.

Hammond, Minn., March 6, 1896.

I send you a sample of the Okabena, grown on sandy land, picked in Sept., and put in a poor kind of a cold storage, where the temperature was uneven and moist from brine. In the middle of Dec. they were taken out and put in a cellar, where the window was kept open, exposing them to the air, which shriveled the skin some.

Of the fifteen or twenty kinds treated in this way, including the Wealthy, Hiberna, Anisim, and other Russians, the Okabena kept best of all and is the only one on hand now. I send you this, in part, as a lesson in keeping apples, as I think it is important to learn how it is best done.

In conclusion, I think that a cool, dry cellar is the best place to put apples on the start, if those conditions could be obtained.

Any light that you can give on this important subject will be thankfully received.

J. M. UNDERWOOD.

Lake City, Minn., March 11, 1896.

The specimens referred to were somewhat shriveled and discolored, but still in a fair state of preservation. It would be of value to know the experience of others in keeping apples or other fruit. How have you succeeded?

SEC'Y.

Secretary's Corner.

WHAT IS YOUR FRUIT PROSPECT?—It would be interesting as well as of value to know, as the season opens, what the prospects are for a fruit crop this season. Please write briefly on a postal not later than April 20, and a summary of communications received will be published in the May number.

TEN THOUSAND DOLLARS FOR A FLOWER.—A New York florist, for the sole right to the famous double carnation known as the "Murella," has paid its discoverers \$10,000. The flower has been raised and owned entirely by a firm owning a large greenhouse near Reed's Lake, Grand Rapids, Michigan. The "Murella" is one of the most beautiful carnations ever seen, being very large and of a deep red color.

RETIREMENT OF CLARENCE WEDGE.—It is learned with regret that Mr. Wedge has been obliged by the press of other duties to sever his connection with the Northwestern Agriculturist as editor of the horticultural department, a position he has filled for several years. The vigor and ability he has exhibited in this place have been noticed and appreciated by all the readers of that journal. Perhaps this change may result in his being heard oftener through the columns of our monthly and another's loss be our gain.

VOLUMES FOR DISTRIBUTION.—Below is a list of surplus volumes of reports in this office for gratuitous distribution to members of this society upon receipt of the postage stated. In this distribution, as is customary, preference will be given to the life members, and consequently no volumes will be sent to other members until April 15, after which date they will be sent to all alike. As there are in most cases a number of volumes of a kind, the chance of getting what is wanted is good. Postage will be returned, less two cents for return postage, in all cases where orders cannot be filled. Volumes may be sent by express, where preferred. Please make selections and notify at once. Address,

A. W. LATHAM, Sec'y.,
207 Kasota Block, Minneapolis, Minn.

MINNESOTA STATE HORTICULTURAL SOCIETY.

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Patrick Barry

THE MINNESOTA HORTICULTURIST.

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MAY, 1896.

NO. 5.

A TOMATO FORCING HOUSE.

F. W. LEAVITT, MINNEAPOLIS.

It is a wonderful thing to see nearly 3,000 tomato vines about ten feet in height, weighted with the rich fruit in midwinter, in Minnesota, and it is a sight which would have been pronounced impossible by the most visionary gardener a few years ago. Yet that was the real vision which met the eyes of the writer, as he stepped into the tomato house of Fred Busch, at Richfield, Minn., on the tenth day of February last. One almost has the idea of being in a southern forest, so great and imposing are the vines, and so soft and warm is the atmosphere prevailing the place.

It was not with every assurance of success that Mr. Busch built this large house, which required 20,000 feet of glass in its construction. Gardeners of experience and large information assured this bold innovator that he could not get sufficient ventilation for a house of the size he proposed to build, and many other objections to it were offered him. But Mr. Busch had an idea, and he lost no time in putting it into execution. That, he thought, was the surest way of proving or disproving the practicability of his plans. He had been operating under 55,000 feet of glass and had gained some valuable experience.

The result of Mr. Busch's latest building venture was a forcing house 60x300 feet, built on the side of a hill and running east and west, with the north wall 18 feet high and the wall on the south 5 feet 6 inches. Clear cypress lumber was used in the construction of this and his eleven other greenhouses. This lumber has been giving the best of satisfaction wherever used for greenhouse purposes. The house was made with an incline of three feet from east to west to facilitate the use of drainage and steam pipes. The roof is supported by seven rows of purlins, four of these being supported in turn by one and one-quarter inch pipe and three by one inch pipe. To the bottom of each of these pipes is attached a plate which is solidly anchored two feet under ground in cement. This device prevents danger from a high wind or from settling.

There are 70 ventilators placed at the top of the roof, 74 along the north wall and 85, 3x4 feet, in the south wall. This gives a complete ventilation. In September, when the thermometer outside was 95 degrees the temperature inside the house was but 10 de-

Exterior View of Fred Busch's New Tomato Forcing House.

grees higher. The roof ventilators are operated by a device, sold by the J. C. Moninger Co., which is both cheap and simple. By pulling a chain, 34 ventilators may be easily raised at one time. No lever is used, and it is strong and easily operated. The house is heated by two sections of steam pipe, 150 feet in each, supplied by a four inch main from boilers 400 feet away. Each section is divided into three sub-sections, one running within 16 inches of the glass, another eight feet from the ground and the third 12 inches from the ground. This gives an even heat throughout the house.

There are thirty-eight beds running north and south with a row of tomato vines on each side of the pipe supports and thirty-nine plants in a row, making 2,964 plants in all. The vines are sixteen inches apart in the row with a space of thirty inches between rows. The beds are seven feet wide with a twelve inch path between them, leaving an open space of five feet between every other row. Two main rows of two inch water pipes, running east and west, with a faucet at every bed, furnish complete irrigation facilities. The seed was sown August first, and the plants set out September first. During the first week in November, the first fruit was picked. The vines have been trained on cords or wire, and are now nearly twelve feet high. 5,000 pounds of tomatoes have been picked thus far (Feb. 10th), and Mr. Busch estimates that he will get 5,000 pounds more by the end of the season.

The variety of tomato used is the Lorillard. Mr. Busch has tried the Acme, Champion and other varieties, but is best satisfied with the Lorillard because of its firmness, fine shape and, above all, for its shipping qualities. A market for the crop is found in Chicago, Duluth, the Dakotas and Montana.

"Utah farmers have learned that a larger quantity and a better quality can be obtained from any cultivated crop by thorough cultivation through close tillage. The old theory that everything must be planted at a great distance apart in order to give air and room for growing, has been exploded. There is no reason for surplus bare ground to be left to support nothing but weeds. Every foot of soil not used for plants should be thoroughly stirred by the cultivator."

The subsoiling idea has brought new converts this year by the heavy rainfall in Kansas. Instead of the subsoiled lands being washed away, the water readily found the immense reservoir underneath, and the soil was not disturbed in its place; in fact, there was greater loss to lands plowed in the usual way.

Interior View of Fred Busch's New Tomato Forcing House.

Experiment Stations, 1895.

(Reports made at the Annual Meeting in December, 1895.)

CENTRAL EXPERIMENT STATION, ST. ANTHONY PARK.

PROF. S. B. GREEN, SUPT.

In presenting to you my eighth annual report, permit me to first call your attention to the work of the experiment stations of the state horticultural society. Their work is increasing in usefulness to the citizens of the state, and their reports are carefully examined by horticulturists generally, and the central station finds in them much valuable information. Their permanency not being assured, they cannot do the best work. This difficulty is in a measure to be overcome by the establishment by the state of two permanent substations, located in sections widely separated and representing various characteristic geological and climatic features. These permanent stations will follow especially those lines of work which from the long period of time necessary to get results from them cannot properly be undertaken by individual experimenters. My idea is that these permanent stations are not to take the place of the present work of our outlying stations, but that by working with them they shall make the whole experiment work of the state more perfect and beneficial. The last legislature provided funds for starting and acquiring two new stations. One has been located at Crookston on a piece of characteristic Red River Valley land; the other has not yet been placed but is destined to go into the northeastern part of the state.

The work of this experiment station and of the school of agriculture has been very prosperous since my last report to you a year ago. In this period there has been a larger attendance at the school of agriculture than ever before. This attendance has been divided as follows: regular course, school of agriculture 224 students; in the dairy school, 75 students; in the summer school for girls, 45 students; making the total enrollment for the past year, 344. As is well known, almost all these are from the rural sections of this state.

Greater progress has been made in the season just past than in any previous year in adding to the equipment of this school and of the experiment station. The last legislature made a generous appropriation, which has resulted in the erection of the following buildings—and in every case they are very complete in their appointments: a "Dining Hall" has been built that contains a dining

room with accommodations for 350 persons at one time and a dormitory sufficient for 70 students. The dairy hall has been doubled in size, making it the most complete in appointments and the largest building for dairy instruction in the country, if not in the world. It contains three large class rooms, a dairy laboratory, machine cheese and butter rooms, office, etc. A sheep barn, swine barn, poultry house and blacksmith shop have also been erected. Besides these improvements, a new sewer has been laid, water pipes have been carried into the garden for irrigating purposes, and all wooden buildings have been painted; a large amount of grading has been done around the new buildings, some drives have been changed, and some new ones laid out, and a large amount of ground prepared for planting in the spring.

Some changes have been made in the faculty of the school of agriculture. Lieutenant H. A. Leonhaeuser has succeeded to the position of instructor in military tactics; Professor A. D. Gaines has become instructor in English, and Professor Wm. Boss, instructor in carpentering. Owing to the growth of the school, Professor Aldrich has been obliged to give up teaching carpentry and to confine his labors to teaching drawing, and your humble servant has given up the teaching of botany to confine his labors to teaching horticulture and forestry.

Publications:—There have been several bulletins issued by the experiment station, two of which (numbers 38 and 39) were from the division of horticulture. Number 38 is a twenty page report on "Garden Tillage and Implements." Number 39 is a report on "Potatoes:—Variety Tests, Potato Scab, Blight and Internal Brown Rot; Tomatoes:—Variety Tests, Training; Strawberries:—Variety Tests; Apple-Tree Sun-Scald; Raspberries:—Variety Tests, Cane Rust." Each of these bulletins is profusely illustrated with half-tones and hand drawn figures.

APPLES.

While no detailed report has been published on the subject of apples by this division for several years, yet it is a subject that has been and is now being carefully investigated here. I expect the coming season to publish a special bulletin on the behavior of apples in the various sections of Minnesota. There is much that is very encouraging for the growing of certain varieties of this fruit in large areas of this state. The list of apples growing on the university farm is large and embraces about all the known promising named sorts from Europe as well as a long list of promising seedlings of Northwestern origin. We have also about 700 seedlings from the best Russian sorts, which we dug last fall, and which are intended for planting out permanently for trial the coming spring.

PLUMS.

Plums produced heavily in 1895, but owing to the weather in August and September they did not fill out well. Fearing the results of this dry weather, we watered copiously twenty or more

plum trees that were heavy with fruit, with the result that the fruit on them was greatly improved in size and the trees in vigor.

PEARS.

The hardier Russian pears have grown well with us when young, but generally have blighted when just ready to commence fruiting. This year we raised a few Kieffer pears on trees that had been laid on the ground for several winters. The Kieffer trees are very vigorous and promise to do well under this treatment.

CHERRIES.

The so-called Russian varieties of cherries, as well as several other sorts, are doing exceedingly well at the university farm. The trees are located on high land with a gravelly sub-soil. Those fruiting the past season here are the Ostheim, Wragg, Geo. Glass and Lithaner Weichel. Of these, the Wragg seems the most valuable. The Lithaner Weichel is a very vigorous, hardy tree but bears such poor fruit that it seems strange it should ever have been cultivated at all.

SMALL FRUITS.

The yield of small fruits in Minnesota in 1895 was much less than usual. This difference is to be ascribed chiefly to the injuries which the plants sustained during the very dry season of 1894. This is also the case with perennial plants here generally, and it will be noticed that even the growth of our hardiest trees was less in 1895 than in 1894, undoubtedly on account of injuries they received in 1894. Blackcap raspberries seemed to be less injured than other kinds at the university farm and produced a good crop in 1895. The Lucretia dewberry also did well. Of the older varieties of raspberries, those that are still especially popular and generally doing well in the state are: Nemaha, Gregg, Souhegan and Older, of the blackcap class, and Turner, Marlboro and Cuthbert, of the red sorts, propagated by suckers; Schaffer's Colossal is also doing well.

STRAWBERRIES.

The strawberry crop was very light, owing partly to the drouth of 1894 as well as to quite a hail storm that occurred just after the first picking. The returns from the old beds were much more satisfactory than from the newer plantings, which corresponds with the results here in previous years as well as the experience of growers generally. The varieties doing best were largely the old standard sorts of former years, such as Crescent, Warfield, Haverland and Bederwood. Of the new kinds planted in 1894, Timbrel is of value for very late use but does not color up well. It is a very robust grower. We have about fifty seedling varieties of strawberries raised here which have been selected from four hundred seedlings that fruited here in 1893. Some of these promise to be good enough to warrant our sending them out for trial.

CURRANTS, GOOSEBERRIES AND JUNEBSERRIES.

Currants, gooseberries and Juneberries produced a good crop of fruit. Our list of these is very complete, and if the coming season should prove a good one for them I shall be able to report on a large number of new varieties of currants and gooseberries. Our interest especially centers around several hundred gooseberry, currant and Juneberry seedlings of our own raising, some of which produced a small amount of fruit in 1895 for the first time.

The new varieties of small fruit bearing a crop in 1895 at the university farm that are especially worthy of notice are as follows:

Royal Church.—This new red raspberry is a little soft for shipping, but it is apparently well adapted for the home garden and near market. The bushes are large, healthy, vigorous and productive of bright red berries of excellent flavor. The season is long. The first fruit was picked July 3d and fruit was produced abundantly until July 25th. Thus far it has been remarkably healthy.

Kenyon's Seedling.—Has been very productive of good red fruit for several years but has finally succumbed to the disease known as cane rust, and leaf curl.

King.—A red raspberry received from Thompson's Sons, Rio Vista, Va., in 1894. It is a vigorous, healthy plant producing a good crop of large, bright red, rather firm berries; season a little earlier than the Cuthbert; very promising.

Columbian.—Is a raspberry of the Schaffer type; a very strong grower and very productive; fruit dark red, very closely resembling the Schaffer. We have fruited it two years, and it shows itself to be well worthy of trial by berry growers. It is especially recommended for canning purposes and when thus preserved has a flavor of rare excellence.

Lucretia Dewberry.—For six years we have grown various kinds of dewberries at the university farm without getting a satisfactory crop, while growers of this fruit on sandy land near by have reported good results. With us the plants have flowered well but have failed to set perfect fruit. In 1895, for the first time, we got a heavy crop of Lucretia dewberries. The fruit was large and was produced in large clusters. It commenced to ripen July 12th and continued to produce fruit over two weeks.

Loganberry.—This is a novelty among fruits and is represented to be a hybrid between the dewberry of the Pacific coast and some raspberry. In habit of growth and methods adopted in propagating it, it resembles the dewberry, since it reclines on the ground and is increased by layers about as easily as the dewberry; but the leaves are closer together, and both leaves and stem are larger than those of the common dewberry. The fruit resembles the blackberry in having the fruit solid, i. e., the core (receptacle) is attached firmly to the fruit. The fruit is of a red color, rather lacking in flavor but not unpleasant. The plants have been grown two seasons at the university farm and came through the winter of 1894-95 without injury, although covered with earth as it is customary with us to treat all our raspberries. It has so far been only moder-

ately productive and, while worthy of trial in a small way, is not anything especially promising. We regard it with very much interest as a curiosity and as a possible forerunner of something good in new fruits. On this account we have raised about three hundred seedlings from it. The figure of it herewith shows the vine and fruit as grown here.



Loganberry Follage and Fruit.

DISEASES AND INSECTS AFFECTING SMALL FRUITS.

During the last five years the disease known as "leaf curl" has seriously affected almost every variety of red raspberry on the grounds of the university farm. Almost nothing is as yet known of the life history of this disease, although its ravages are very wide spread over this country. It is, however, well known that the land once infected with it retains the infection for several years. Of the older sorts of the red raspberry, the Turner seems to have the power to resist the disease better than any other grown on the university farm. The new variety known as Royal Church also has shown very desirable resistant qualities in this respect. This disease has not affected the blackcap varieties so far as observed. Anthracnose, or cane rust, of the raspberry, injures to some extent almost every variety belonging to the blackcap class as well as many red kinds. It has, however, been very successfully held in check at the university farm by spraying the canes with Bordeaux mixture. But the injury from this disease has not been nearly as serious a matter as that from "leaf curl," and blackcap raspberries have consequently come to be regarded as more reliable than the red sorts. A detailed report of our successful treatment of this disease was given last year in Bulletin No. 39 of this station.

There has been very little injury done to small fruits by insect pests the past year.

NURSERY.

The station nursery is in good condition and contains a greater variety of fruit, forest and ornamental trees and plants than ever be-

fore. A large number of additions have recently been made by purchase, and donations have been received from various persons. Professor C. S. Sargent, of Arnold Arboretum, has recently sent us a collection of 125 species and varieties of plants.

FORESTRY.

The drought of 1894 was very severe, and we lost a large number of European birch, canoe birch, wild black cherry, poplar and European larch in our forest plantation on the station grounds. The street trees on our grounds that were watered in 1894 showed plainly the effect of it by the increased growth in 1895. Very generally among all kinds of trees, the growth of 1895 was less than that of 1894, showing plainly the effect of the severe dry weather of the previous year, that prevented the full ripening of the wood. Where trees have died out in this plantation, the vacancies have been filled with a mixed planting of hardy material. Many species look well and are taking on something of the forest appearance. The work of this division of horticulture has been extended to the drier portion of the state by a planting of four and a half acres which we made last spring in Lyon county, on high prairie in the couteaux. The planting consisted of forty blocks of trees, arranged so that each block includes some quick growing sort intermingled with some durable kind. In many of these blocks, shrubbery has been introduced to hold the snows and afford shade to the land. I am of the opinion that into every new forest planting, the wild plum, Juneberry and sand cherry should be introduced whenever the land is fitted for them.

FOREST SEEDLINGS.

It has been the policy of this division to raise forest tree seedlings of various kinds for use in the trial plantings made and to be made, and especially to raise newly introduced species that cannot be purchased from the general nursery trade. This year, about 3,000 hackberry seedlings from seed grown in the Red River Valley have been raised, 3,000 seedlings of the jack pine, 5,000 bull, or ponderosa, pine, besides a number of small lots of basswood, buckthorn, black locust, etc.

VEGETABLES.

Our experiments with vegetables have been along the lines following in previous years. In the growing of potatoes these consisted of (1) trial tests of varieties carried on at the university farm, the couteaux farm (Lyon Co.) and in McLeod county; (2) the use of corrosive sublimate to prevent scab; and (3) spraying of the vines to prevent blight of the foliage. In the growing of tomatoes, experiments have been undertaken to determine the best way of preventing tomato rot and the varieties least subject to this disease. The results of experiments with tomatoes and potatoes will be found reported in Bulletin No. 45. With onions, experiments have been made in growing several foreign kinds by the transplanting method.

In 1894 we made a specialty of garden implements; the past year we have made a specialty of potato machinery and by judicious begging have had donated to the station for exhibition purposes and for insruction about seven hundred dollars worth of the most improved potato machinery. There is probably no institution in the country which has such a complete outfit in this line.

The list of machines donated and their prices are as follows:

DOWDEN MANUFACTURING CO., PRAIRIE CITY, IOWA.

1 Dowden Potato Digger.....	\$120.00
1 Dowden Potato Sorter.....	15.00
1 Dowden Potato Cutter.	2.50

ASPINWALL MANUFACTURING CO., JACKSON, MICH.

1 Aspinwall Potato Planter.....	65.00
1 Aspinwall Potato Cutter.....	10.00

DAVENPORT & PRINCE, DOWNER'S GROVE, ILL.

1 Davenport Automatic Potato Cutter and Planter.....	80.00
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POTATO IMPLEMENT CO., TRAVERS CITY, MICH.

1 Acme Hand Potato Planter..	2.00
1 Hill's Improved Knapsack Sprayer.....	3.00

J. COLEGROVE, CLEARWATER, MINN.

1 Colegrove Hand Potato Planter.....	2.00
1 Colegrove Potato Cutter.....	8.00

HOOVER, PROUT & CO., AVERY, OHIO.

1 Hoover Potato Digger	125.00
1 Hoover Potato Sorter.....	15.00

F. SPLITTSTOSER, NORTH BRANCH, MINN.

1 Splittstoser Power Potato Sprayer.....	55.00
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SCOFIELD & CO., FREEPORT, ILL.

1 Scofield Potato Planter.....	35.00
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C. J. CUMMINGS, TULLY, N. J.

1 Cummings Potato Digger.....	75.00
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BATEMAN MANUFACTURING CO., GREENLOCK, N. Y.

1 Improved Robbins' Potato Planter.....	65.00
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DEERE & MANSUR CO., MOLINE, ILL.

1 Potato Planter.....	
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Besides the above we have received the following gifts.

W. A. LAKE MANUFACTURING CO.

1 Peerless Plant Setter.....	10.00
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RICHENBACKER & BALDRIDGE, COLUMBUS, O.

1 Transplanter.....	1.50
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ARTHUR HASTINGS, SOUTH BERLIN, MASS.

1 Asparagus Buncher..	
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MORGAN BROS., MINNEAPOLIS, MINN.

1 Surface Hoe..... .75

Among other valuable gifts received during the past year is a very choice collection of native and foreign woods from the well known horticulturist and writer, J. S. Harris, of La Crescent. This gift is very highly esteemed and is especially useful to us for instruction. Mr. Harris has also kindly permitted this division to make a copy of his very complete and accurate catalogue and description of the pomaceous fruits grown in the Northern states of the Mississippi Valley. This book contains descriptions, outlines and drawings of over two hundred apples and pears.

IRRIGATION.

The garden at the university farm has recently been equipped so that about three acres of it can be irrigated. Provision was made in 1895 for experiments in sub-irrigation as compared with surface watering, but the well distributed rains furnished sufficient water for growing crops so that there was little advantage gained from that artificially applied. But we found it very convenient to have

Irrigating Strawberry Plants.

water near at hand when transplanting and when renewing our old strawberry bed. In the case of the old strawberry bed, each row was watered as soon as cultivated after burning, and this was a great help in giving the plants a vigorous start. The illustration herewith shows the method followed in watering. Iron pipes bring

the water to the land, and it is then distributed by means of V-shaped wooden troughs, which are shown in the illustration, with holes so arranged that they supply several rows with water at one time, which is often a great advantage in irrigating. In this case the water is pumped into an elevated reservoir which connects with the system of pipes in the garden.

SPRAY PUMPS

The demand for good spraying apparatus has generally been well met by manufacturers, and there is now on the market a great variety of pumps, tanks and nozzles, from among which it would seem that almost any one could find an outfit suited to his needs. In selecting spraying apparatus, we found no trouble in getting a knapsack spray pump adapted to our wants, but we needed a more

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Barrel Spray Pump.

powerful pump, such a one as could be used successfully in spraying plum, apple and ornamental trees in a small way. Such a device is shown in the figure and is described as follows: The essential parts are a good hardwood barrel, such as a linseed oil barrel, mounted on and securely fastened to a light framework of oak. On the barrel and at one end is mounted a powerful force pump with

attachments capable of throwing one or two fine, strong sprays at one time. The liquid in the barrel is kept agitated by a small stream of water passing through a one-fourth inch pipe with a one-sixteenth inch wide opening to the feed pipe of the pump in the bottom of the barrel. This plan is desirable in many cases.

The lower end of the feed pipe is covered with a fine copper screen. In the center of the top of the barrel is an opening, eight inches in diameter, with a tight fitting cover. This is so large that the barrel may be easily cleaned. The whole expense of making this machine was as follows: one lined oil barrel, \$1; pump, \$6.50; 50 feet of $\frac{1}{2}$ inch hose, \$3; strainer, \$1.50; 2 nozzles, \$1.25; bolts, etc., 50 cents; total cost, not including labor of above, \$13.75. This is much cheaper than any similar good spraying machine which is offered by manufacturers.

We claim for it the following advantages: It is a powerful machine and well adapted for the purposes of the heavier work required for spraying trees for protection against insects and fungus diseases. It is sufficiently powerful for spraying willow or other windbreaks or hedges infected with the larvae of the saw-fly and trees of similar size. It is easily carried about by one horse either on a stone-boat or in a wagon, which is a great convenience. The machine is simple in construction and is easily made by any good mechanic.

Improved Strainer for Bordeaux Mixture.

THE STRAINER.

The figure plainly illustrates the form of strainer which we have hit on as being most desirable for straining the Bordeaux mixture and similar materials. It is made of copper wire gauze with twenty spaces to the inch, soldered together and to a rim of galvanized iron. It has the merit of not clogging so quickly as the ordinary flat strainers, since all the sediment collects in the lower end, leaving the sides always free for the liquid to pass through. This is a very important matter for those using Bordeaux mixture, which must be strained and is often very troublesome about clogging the common flat strainer. We heartily commend this idea in a strainer as being

very practical. The credit of adapting this form of a strainer to this purpose is entirely due to Mr. R. S. Mackintosh, of the division of horticulture.

DISCUSSION.

Mr. C. L. Smith: What do you think about transplanting the jack pine?

Prof. Green: I think the jack pine will do very well to transplant.

Mr. Clarence Wedge: Judge Moyer speaks of my sending him a dozen white pine. I would like to ask him if they grew?

Judge L. R. Moyer: I planted them, but not one of them grew. I do not think it was any fault of the pine itself, but I think it was on account of the prevalence of the white grub. I think many of them died from the attack of the white grub.

Col. J. H. Stevens: I merely wish to say that I can certainly see the great benefit this experiment station, of which I am happy to say Prof. Green is at the head, is to the state of Minnesota and the entire Northwest. The paper he has just read is fraught with so much importance to the future of this state that it cannot be too highly valued. We are certainly a fortunate people to have such an institution in our midst, where every one can examine and know what is useful and also receive instruction. (Applause.)

Mr. Smith: There is one thing I have been pounding away at in regard to this experiment station; I want to emphasize it right here, and I wish every member would make a note of it. There is a most unsatisfactory feature connected with the experiment station, and that is the neglect of the people of the state of Minnesota to take advantage of the information given out from the station in the form of bulletins. These bulletins that Prof. Green speaks of will be sent free to any citizen of Minnesota that wants them. There is no expense attached in sending them, they are sent free to any one applying for them, and they are most valuable bulletins, filled with the most important information, and yet so few people call for them. Now, what I would like to ask of the members of this society is that when they go home they tell their neighbors about these bulletins, and ask their neighbors to write to Prof. Green for these bulletins and use the information they contain. If we can educate the people of Minnesota to depend upon the bulletins for their information upon horticultural subjects, instead of on the agents who come around to sell trees, they will have solved the most important problem in Minnesota horticulture. We ap-

preciate the bulletins, but I don't think our neighbors know of them. The one thing we ought to do is to interest the people of the state of Minnesota in the use of the information they contain, so they will be calling for them, and the information they contain will go out over the entire state.

Mrs. Jennie Stager: I send mine around. I lend it to fifteen or twenty farmers. One man raised two thousand bushels of potatoes, and he tried the preparation of corrosive sublimate as recommended in one of the bulletins by Prof. Green, and he said it was the best thing he had ever tried on his potatoes. I do not know but what others who get the bulletin do the same thing.

Mrs. A. A. Kennedy: You might just as well ask the common farmers to read Shakespeare as to read those bulletins.

Mr. J. S. Harris: If a man's name once goes on that mailing list it stays there, and a good way is to send in the names of your neighbors to be placed on the mailing list.

Mr. J. W. Murray: There is not one farmer in ten that knows there is such a thing as these bulletins. If a person wishes these bulletins, will they be sent to him continually?

Prof. Green: If a person desires a certain bulletin and applies for it, that bulletin will be sent him, but if he desires his name placed on the mailing list, every bulletin that is published will be sent.

Mr. Wyman Elliot: If every member would put on a postal card from ten to twenty names of their neighbors who would read those bulletins and would send them to Prof. Green, they would all be placed on the regular mailing list. Put their names on a card with the P. O. address and mail it to Prof. Green or to some one connected with the station, and they will all receive the bulletins.

Prof. Green: They are not published at regular intervals, but there are seven or eight bulletins published every year. We publish now about 5,000 bulletins.

Mr. Harris: I do not think that half of the farmers in the state know there is an experiment station. (Laughter). I know there are men in our county who are getting the bulletins and do not know there is an experiment station. I would suggest that we send out one copy to every man in the state of Minnesota. Most of them know nothing about it. They cannot find out what the experiment station is or where it is, unless we take some extra pains to let them know.

Mr. G. J. Kellogg, (Wisconsin): When the bulletins are

sent to the farmers, they are thrown to one side and never touched again. These book peddlers come around and tell them what is in their books they have to sell. They tell him they do not want the book, but he pays no attention to that if he is a successful agent, and he begins turning the leaves and telling what is in the book, and before he knows it the man is interested, and the agent sells him a book. If you want the people to read those bulletins, you have got to do a little missionary work. To send them to the people,—you might just as well stick them in the stove, that is where they all go anyway. (Laughter).

Mr. Somerville: It is a hard matter to distribute information if the people will not receive it. There are so few people that take an interest in horticulture whatever, that I do not know how you are going to get at it. As Mr. Harris has well said, there is a large percentage that do not know there is a state experiment station in the state. If we give them any work on horticulture, it is laid on one side, and they hardly ever look at it. They may be educated in everything else in the line of farming, but horticulture receives no consideration whatever. They have a good lot of hogs, they have all kinds of stock, and it looks well, but they never have any fruit; they will eat pork and beans the year round, and that seems to satisfy a certain class of people. You ask them why they do not grow fruit, and they say, "You can do it, but I can't do it; I have not got the time, but you have nothing else to do." (Laughter).

Mr. Harris: They are like the farmer who drove up to my place during the past year and wanted some apples. I had six bushels sorted out to feed to my hogs. He wanted a few bushels, but when I asked him twenty-five cents a bushel for them, he said he guessed he would take the lot. I told him I had sorted them out for my hogs, but he said they would answer very well for him, and he took the lot. (Laughter.)

Mr. Somerville: After the hailstorm passed over my place we found it had knocked off about two hundred bushels of apples. We picked up the best of them and took them to the Rochester market. The ground in the orchard was covered all over. There was lots of apples lying on the ground which we did not pick up, and the people came in swarms for several days and picked up those very apples that were hardly fit to feed to the pigs. They came from a distance of eight to ten miles. I asked them the question, "Why don't you raise ap-

ples?" They said, "Oh, you know how, and you have nothing else to do."

Mr. G. J. Kellogg: I am learning something while I am here. I thought you were head and shoulders above any other state in the matter of agricultural knowledge. We distribute tons of literature at our farm institutes, and the people take everything we give them.

Col. Stevens: I think one reason for that is, that the annual issued by the Wisconsin institute is much more tasty than ours. Ours is gotten up in a cheap style, and the people think it is cheap literature.

There has been some objection to our annual on account of the bad covers and being printed on poor paper. If they had been neat and tasty like the Wisconsin annuals, they would have been read more.

Pres. Underwood: I do not want our Wisconsin friends to go back home with such a poor opinion, and I find it necessary to defend the publication of our farmers' institute annual. I am one of the board of managers of the institute, and I think Mr. Somerville and Mr. Wedge will bear me out when I say that there is no session of the institute that is so well attended as the one that is advertised as giving away to every one present one of the publications. I have been at an institute and seen the room just crowded when the thermometer was 40 or 50 below, and you would not suppose a farmer would go anywhere that day—and I have seen the room packed with farmers and men from the country, and they were all there to get those books; and just as soon as the morning session was over and it was announced that every one present could have a book, it was hardly possible to get enough books. I have seen Mr. Gregg look at a young man, considering whether he had better give him a book or not, as he thought he was too young to make good use of it. I told him to let him have the book; he wanted that book to read. I have got an entirely different impression of the farmers from what some of you have. I believe they like good literature, and I believe they read our reports and publications. There may be some that do not read them, but I am surprised that this opinion prevails that farmers generally will not read them. I wish to say that the best thing Mr. Wedge can do possibly is to see that our literature is distributed among the people at the institutes and to solicit membership for this society. That is a missionary work he ought to do—and to distribute bulletins from the state school. They want the

reports of the farmers' institutes. Col. Stevens says they are not as well gotten up as the Wisconsin reports. They are gotten up well enough so that all farmers want them. I think if they had Col. Stevens' picture in, everybody would want one. (Laughter.) I hope Mr. Wedge will improve his opportunities.

Mr. Harris: We have thousands and thousands of people in the state who are anxious to get hold of good literature.

Mr. Somerville: I think the farmers' institute is the best way to get that literature before the people. I was not speaking of that class of people who attend the institutes, I was speaking of that class who stay at home.

Mrs. Kennedy: I stopped down here on the street yesterday within three blocks of the court-house, and I asked a man I met where the new court-house was, and he said he didn't know there was a new court-house in the city. (Laughter and applause).

Mr. Wedge: Mrs. Kennedy has said it for me. That is just the case in the country. No matter how attractive a publication is made, they would not read it. I am confident that this literature sent out by the farmers' institute, this "Annual," is read with as much avidity as we could possibly desire by the people who attend the institutes, and there are a large number of people who do it. I do not think any other cover would be more attractive, and they show it in every way that a man can show his interest in anything. Now, I want to say just a little about what work I am able to do with the institute corps in horticulture. I want to say in the first place that I realize myself at least some of my shortcomings as an institute worker. I am not as versatile in incident and anecdote as my friend Mr. Somerville has been, and also a good share of my other friends. There is a great want of appreciation at those gatherings; it goes in at one ear and out at the other; they do not believe there is any good in trying the business up here, and you can hardly wake them up. There is a share of them that are appreciative and seem to take a great interest. For instance, at Portsmouth, Minn., we had a wonderfully interesting meeting; they seemed to be as eager and interested in horticulture as is this audience before me to day; they seemed to be intelligent on the subject, and quite generally through the southern part of the state, and even in the northern part of the state in some places where small fruits were interesting the people, near Aitkin and other sections. It is not altogether confined to sections. We had an institute in the southwestern part of the

state, in the apple country, and where they raise a great many kinds of fruit, and yet we had a dumb audience; they were heedless on all subjects, and perhaps especially so on horticulture. There is very little pleasure in speaking to such an audience. I want to tell you that this distribution of the Farmer's Annual cuts a great figure in preventing the getting of memberships. They make a great handle of this in advertising the institute, and the people come in for a free book, and they get it the first thing. What have I to offer them? I have something to offer them for one dollar. One dollar in these times is of a very good size, something a man does not part with very readily. I think you can see how it acts. It is difficult to interest them in something else. Mr. Gregg allows us all the privileges we deserve, but at the same time he pushes that book, and he very properly dislikes to have me push anything that looks like getting money out of the people. This free book militates very strongly against our increase of membership. I think our secretary offers something now that will be very good. He offers to send me magazines to distribute free to every one, or to those who like to learn something about horticulture. I can say to the people, "Here we have a magazine for you, and it will tell you how you can become a member of our society. You will receive this magazine every month, and at the end of a year you will receive a finely bound volume." I think I can promise you a good many members. I desire to serve the society as loyally as I can, and I know of nothing that will do the people as much good as a membership in our society.

MINNESOTA CITY EXPERIMENT STATION.

O. M. LORD, SUPT.

I received from the state station two Moldavka plums, one Abundance plum two Strawberry plums (Japan), six Gardner strawberries six Conrath black raspberries, four Columbian raspberries, two Logan raspberries. All have made fine growth and are in good condition for winter.

The gooseberries received last year bore a fine crop of excellent fruit. The plum crop was small; only twenty-five varieties bore fruit; some of it was, however, of fine appearance. The Ocheeda bore for the first time, also the Stoddard and Comfort. The Wyant had a full crop, and the Richland bore a little fruit, the only one of the Russians that fruited.

Several varieties of plums cions from Edson Gaylord, of Nora Springs, Iowa, were set as top-grafts, but only a few lived. Nearly

all top-grafting was a failure with me last spring, while the crown-grafting succeeded, with a loss of not more than one per cent. This difficulty has occurred once before, but I am unable to assign a satisfactory reason for it.

The apple trees here were not affected with blight as much as in the two preceding years, and nearly all have made good growth.

GRAPES.

The first blossoms of all the grapes were killed by frost, but a good crop matured, especially of Iona and Moore's Early.

The crops of red and black raspberries were below medium in quantity.

Blackberries were nearly a failure. One acre at blossoming time was cut off close to the ground, and the ground plowed between and close to the rows and thoroughly harrowed both ways till in good condition, and the ground then heavily manured. The growth of canes now promises a good crop next year.

The season has been quite favorable here for all newly set plants, and of course for the growth of weeds also. The outlook at present for fruit next year is much more favorable than at this time last year. There is a better development of fruit buds and more moisture in the soil.

WINDOM EXPERIMENT STATION.

DEWAIN COOK, SUPT.

I herewith present my semi-annual report. Fruit trees ripened up their wood early and are going into winter quarters in fine condition. There was about six inches of rain fell at one time the latter part of September; still, on account of so much fall wind, the soil is rather dry, rather too much so for the perfect wintering of strawberry plants—of which, by the way, we have the best stand we ever had, consisting mostly of Bederwood, Crescent, Warfield, Captain Jack, Enhance, Cumberland and Princess. I name them in the order that I consider most valuable, taking their capacity for making plants into consideration.

I want to amend my midsummer report on currants, which was a little premature. We had the best crop of currants we ever had, and they sold more readily than ever before, owing to the scarcity of other fruit. These currants I refer to were all Red Dutch and were kept heavily mulched with cow manure the last three years. My report at that time on Red Dutch will apply to one hill that got in by mistake, some half dozen Long Bunch Holland you sent me some three or four years ago, and they were not mulched. Of the unmulched lot, the Long Bunch Holland were the best and the Red Dutch and North Star the poorest. I believe the Stewart's Seedling to be a valuable addition to our list of currants.

Of the experimental stock you ordered last spring, the ten four or five year old apple trees from C. G. Patten have not done very well; one of them died during the latter part of the summer: cause, dry

weather and perhaps insufficient cultivation. I like a thrifty two year old the best, or even a No. 1 one year old. The three Loudon raspberry plants sent me from the Thayer Fruit Farm were received in apparently fine condition and were set immediately in the best place I could find; two of them failed to grow (perhaps there was too much manure in the soil), the third plant made a growth of about five feet. It resembles the Turner in growth, except in that it has several branches from two to three feet long and is entirely free from disease.

Of apples I have had so little fruit, I suppose I ought not to say much, but of the trees, most of the Russians are looking good; the Hiberna is especially good, as is also the Romna—they seem to be identical. The Yellow Fawns (possibly this is Yellow Transparent, but I think not) is also especially promising. In the orchard, where fully exposed to the winds, it had the most perfect foliage of any, but in the nursery, closely shut in by the willows and other trees, it had very poor foliage. (I have some fruit for the winter meeting). This indicates that this variety, like numbers of others, will do better in a windy, exposed place. My experience with the Wealthy is rather the reverse of this.

The Juicy White is also a good tree and a fine eating, early apple. The Antonvoka is also a promising apple for this section. It is a rather slow grower, but the tree ranks with the Duchess in hardiness, and the wood is very hard and firm, resembling the crabs in this respect. Patten's Greening, Okabena and Peerless do not show any weakness, except, perhaps, that of hardiness. Patten's is, perhaps, the hardiest of the three; the Peerless seems to ripen its wood better as the trees get older. Thompson's seedlings seem to rank with those above mentioned in point of ability to stand cold, but apparently lack adaptability and are on the decline. Judson looks the best at present. One of the last named trees bore a few small, gnarly apples this season. None of them are promising here. Hotchkiss is a poor tree, as also is Scott's Winter; Daisy is better but lacks hardiness. Compton's No. 3 is a scraggy growing crab, but is promising. Of Gideon's seedlings, the Martha has been growing here for nine years. It is a nice tree but does not bear any yet. The following varieties, two small trees of a kind, were set in the spring of 1891 in a densely sheltered place and were feeble and much subject to leaf blight, or leaf scab, the first two or three years, or until I thinned out the surrounding trees and let the wind in, viz.: Excelsior, hardiness 10, condition good, one tree dead. August, one tree dead, other tree in fair condition and getting better each year; it may not be quite hardy enough. Florence, hardiness 10, condition good—with me this is the most promising of Gideon's seedlings with the possible exception of the Martha; Peter, hardiness 7 or 8, one tree dead—this tree grew the best of the lot the first three years, the remaining trees now begin to look aged. Martha, hardiness 10, (one tree dead) promising, condition good; Gideon's No. 6, hardiness 6, condition of trees not very good; Grarey, hardiness 6, condition of tree rather poor, (one tree dead); January, hardiness 7, not promising; September, hardiness 8, condition feeble (one tree dead). These trees were all growing on well enriched land and well cared

for; no blight, as it is generally understood, has even been noticed upon them, and the conditions were not favorable for root-killing. Pride of Minneapolis is a good grower and bore freely of good sized, yellow, russetty crabs; very promising.

My notes show that the following varieties of apples and crabs were considerably affected in the foliage by the hot days of summer and perhaps lack of moisture, viz.: Hotchkis, Minnesota, Red Queen, Hibernial and all of that family, Barney, Breskovka, Sweet Pipka, Russian Green, Virginia. Some others were probably just as much affected but were not noted. The following varieties' buds were little affected in the foliage by the adverse condition, viz.: Yellow Fawns, Pointed Pipka, Whitney, Rose Aport, Early Strawberry, Daisy, Okabena, Peerless, Patten's Greening, Maiden Blush and probably several other varieties not noted. I have top-worked the following varieties onto hardy stocks, bearing size, the past spring, and intend to do considerable work in this line in the future, viz.: Northwestern Greening, Winter Ethel, Wolf River, Peter, Winsted Pippin, Utter's, Barney and Nos. 2 and 3 from Wm. Somerville and the Sweet Cider crab.

Of plums the Desota and Wolf generally bore a fine crop and were little affected in size by the drouth. I also have the Wolf and Desota on Marianna stock, some fifty trees on this stock. They are much less productive than on the Americana stock. Young plum trees set from two to five years generally this past season did not fruit. I have a fine lot of many varieties that are getting the best of care. The Milton is not hardy enough for us. The Rockford gets all destroyed each year by the curculio. It seems to be a shy bearer while young, at least I have had two of the trees growing for five years and have been unable to get any of the fruit to sample. The Cheney is nearly as bad, as far as the curculio is concerned. There are but few fruit buds on any Rockford plum trees for next year's crop. The Mankato plum fruited this year and is one of the earliest and finest plum I ever ate. S. D. Richardson sent me the tree, a small sprout, about three years ago. I consider it of extra value. It seems to be about curculio proof. There are five or six new varieties of plums that I must add to my orchard next spring if I can spare the wherewith to get them.

As to blight, we have been making war upon it, and we have but little of it. My Early Strawberry trees were affected some by it the first season. We also saw a little touch of it on a Whitney and on a Virginia crab; otherwise we had none. As to sunscald, with the exception of one pear tree, one plum tree and fifteen or twenty butter-nut trees and one or two cherry trees, we have no sunscalded trees on the place. My experience and observation would indicate that, at least with the apple trees, only the unhealthy trees sunscald. I don't think we are as much subject to sunscald of apple trees here on the open prairies as they are in the timber. We have been bothered but little with the tent caterpillar the past two seasons, owing undoubtedly to the continued icy sleet of the winter of 1893-4. Of grapes, the Worden gives us the most satisfaction. Most of the new varieties sent me three or four years ago were finished by our May frost. I shall plow up most of my grape vines, not because I can't grow grapes, but because there is too little money in it for me.

EUREKA EXPERIMENT STATION (GRAPES).

C. W. SAMPSON, SUPT.

My grape vines came through the winter in fairly good condition, especially those vines that were protected with a covering of straw over the roots. As we had some very cold weather and not much snow, a good many surface roots were killed. The dry weather of the past summer seemed to affect some vines, as the ground was perfectly dry to a depth of six or eight feet.

Durant Amber bloomed June 5th, and the grapes were ripe about August 28th. They are a rich, highly flavored grape and a vigorous grower. A Telegraph vine set eighty bunches of grapes, and every bunch dropped off. I consider it almost worthless. The Woodruff Red, fruited a few grapes; fruit about the size of the Brighton; color red; of excellent flavor. The White Diamond is a hardy vine, and a vigorous grower; foliage large and healthy; very prolific in bearing; cluster large and handsome, often shouldered; color greenish white; berries large; skin thin but tough. Moyer.—An early red grape; first ripe grapes September 1st; the quality is prime and yield very good; cluster not very large, but increase as vines grow older. It is sweet as soon as colored; skin tough but thin; pulp tender, juicy, of delicious flavor and entirely free from foxiness. Niagara.—This vine made a good growth; bunch medium to large, compact, occasionally shouldered; berry large, uniform; skin thin but tough; pale green at first, changing to pale yellow when fully ripe; foliage thick and healthy. Eaton.—New black grape. This is the largest berried grape we have grown; bunches very large; it ripens with the Worden; quality not the best, but the large berries are full of juice and have tender pulp, which releases the seeds readily. Worden.—An excellent black grape, both for home use and market; it is an enormous cropper; vines very vigorous; Worden is ripe and gone before Concord comes in. It is an early black grape, very large in cluster and berry; of good quality, selling well everywhere. In brief, Worden is an improved Concord, being larger in both bunch and berry, handsomer, nearly two weeks earlier and of better quality.

VIOLA EXPERIMENT STATION.

WM. SOMERVILLE, SUPT.

I was notified by our honorable secretary that at their last summer's meeting I was appointed as an agent for an experiment station. While I am thankful for the honor conferred upon me, I beg to be excused from experimenting with any thing further than I have been doing.

I have been trying in an individual way to see if what we are seeking for can be found among the new Russians. I received scions from Washington and bought little trees from Professor Budd, Mr. Tuttle, and Mr. Sias, until I had over 200 varieties of Russians in my nursery. Last spring, the trees being three and four years old, I thought I would set out a commercial orchard, and selected four acres east of my old orchard, the ground sloping slightly

north. For a commercial orchard I only want a few varieties, so I selected tried varieties, whether Russian or seedling, setting them 16½ feet apart each way. The varieties I selected for this purpose were of the Duchess family, the Wealthy, Hibernial, Longfield, Good Peasant, McMahon White, Patten's Greening, Okabena, Repka Malinka and Brett's seedlings. Then in between the rows, breaking joint, as it were, I set my experimental trees of eight or more varieties of Russians and every seedling that I know of that is before the public except the Peerless, and next year I will try to get some scions of it and top-work them, for fear I cannot raise apples without it. I am aware that in a few years these trees will be too thick, but in these years I can get fruit enough to pay for tree and labor. It is an easy job to grub them out when they come in contact with each other. The trees in this young orchard have made a vigorous growth each year since planted, and a large proportion of them fruited this year, yielding large and attractive specimens.

My old orchard, containing a number of Russians, Duchess and other varieties, and ranging in age from fifteen to thirty-five years, yielded a reasonable crop of fruit this year. But the hail-storm we had on the fourth of August knocked off a large proportion of the fruit and battered what was left so badly that they were hardly salable. The Malinda and Repka Malenka being small and hard were not so badly damaged as the rest.

Our raspberries bore a very good crop, although the canes had been badly damaged by the previous winter, as I had not covered them. The varieties I have are the Cuthbert, Schaffer's Colossal, Caroline and the Golden Queen; the latter did not prove hardy. Of the blacks, I have the Ohio, Gregg, Tyler and Mammoth Cluster. My grapes were a fair crop, and I have a number of varieties. My strawberries were almost a failure. We had an average crop of plums, also a good crop of currants, especially of a North Star that the Lake City people sent me. From the same source I received the Okabena, a number of Thompson's seedlings and a variety of plum trees and gooseberry bushes, all of which have grown remarkably well. Mr. Wedge has sent me some plum trees and other stuff, of which I shall make note hereafter. These things I appreciate, as this was the only stock given me to experiment with. Everything else I have either raised or bought.

SAUK RAPIDS EXPERIMENT STATION.

MRS. JENNIE STAGER, SUPT.

I sent a report some time ago about the plants sent me in the spring. So far they have all done well, except the golden willow; that died down to within a foot of the ground.

Strawberries.—We have planted this year 4,000 strawberry plants, consisting of Crescent, Bederwood, Warfield, Jessie, Parker Earle, Captain Jack, Robinson, Woolverton, Enhance, Cumberland, Triumph, Michel's Early, Shyster and Princess, (the Wilson has never done well here), and hope to have a good account of some of them next summer.

Raspberries.—Of raspberries, we have Philadelphia, Crimson Beauty, Cuthbert, Nemaha, Ohio, Turner, Yellow Queen, Gregg and Tyler. Most of the red ones died down to the ground last winter, owing, I think, to the drought of the year before.

Blackberries.—Snyder and Western Triumph. We very seldom have half a crop, as they ripen in the driest part of the summer, and mulching does not seem to help them much.

Currants.—Victoria, Cherry, Red Dutch, White Dutch and Fay's Prolific. All currants do well here with a good mulch of coarse manure. In fact, we can grow no small fruit without a mulch of some sort.

Gooseberries.—Downing, Houghton and Canada Belle. We prefer Downing, but all bore well this year.

Plums planted this year.—Two each of Homestead, Lyman, Desota, Weaver, Rockford and Rollingstone; fruiting, Weaver, Desota and about fifty seedlings, most of them good. We can raise good plums here and plenty of them, although this year the late and prolonged frost destroyed the early ones.

Grapes planted this year.—Two each of Janesville, Moyer, Brighton, Lady and Niagara; fruiting, Concord, Roger's No. (?), Janesville, Moore's Early, Pocklington, Brighton, Worden, Agawam and Lindley. The red grapes ripen earliest here and are the most suitable. The Janesville turns black earlier but sweetens slowly and has a poor taste and flavor. The Concord generally ripens on a southern exposure here and is a good fertilizer.

Russian Mulberries.—Fruit white and black; very insipid. We have twenty-five trees, generally full of fruit each season, and it keeps the birds from our other fruits.

Apples.—We planted one hundred trees ten years ago, most of them Hyslops and Transcendents, with a few Duchess. On account of the blight, we have only two Transcendents and two Duchess left. We have also about twenty-five Russians. Twelve of those were planted this spring, the rest about seven years ago. Three have come into bearing, samples of which I sent this fall. I also sent samples of apples at the same time from seedlings given out several years ago by Peter Gideon and raised by Erasmus Cross, of this place, which were very good. From the hundred trees sent he has twenty in bearing—and with them were some of my seedling plums.

Conifers.—Scotch and common pine, cedar and juniper savin. Of other trees we have oak, basswood, maple, elm, poplar, Lombardy poplar, mountain ash, common ash and box elder.

Roses.—Hybrid perpetual. About fifty, including climbers.

Shrubs.—Spireas, jasmine, snowball, spotted and common elder, bush honeysuckle, lilacs, white and lavender, and berberry Thunbergi.

Hardy Bulbous Plants.—Paeonies, red, white and pink; nine varieties of lilies and bleeding heart.

MONTEVIDEO EXPERIMENT STATION.

LYCURGUS R. MOYER, SUPT.

This station was established in 1892 and has been engaged for the most part in the trial of ornamental shrubs. Montevideo is located on the 45th parallel, not far from the 96th meridian, and thirty-five miles from the western boundary of the state. Horticultural experiments to be of much value must be continued through a long series of years; such conclusions as are here recorded must then be looked upon as entirely provisionable, or at least subject to future modification and revision.

The past two seasons have been very trying ones; the annual precipitation of moisture has been very far below the normal, and the climate has exhibited certain vagaries, approximating those found in desert regions; frequent periods of intense heat combined with great drought have prevailed; a hot simoon from the parched and simmering southwestern deserts has frequently visited us; the lakes and sloughs on the prairies have dried up and disappeared; the Minnesota river has ceased to flow. At Montevideo, the soft maple trees throughout the town have died, as well as many cottonwoods; on the prairie farms many groves of trees—some of them twenty or more years old—have succumbed to the drought; the cottonwoods and the soft maples on the prairie farms are in every stage of decrepitude; and even the box-elders are dying in many places. The experience of the last two years is confirmatory of the opinion heretofore expressed that forestry on the prairies will never succeed. We can and must have successful groves and shelter belts and diversified ornamental planting, but we shall never be able to raise successful forests by artificial planting on the high, dry, rolling prairies of western Minnesota; the climatic conditions are against it; but we may still have trees.

The green ash still remains to us a success everywhere, and in most locations the cottonwood and soft maple will continue to succeed. The bur oak is a noble tree, and it is unaffected by drought. Whoever is able to offer for sale well rooted and transplanted bur oak trees at a reasonable price will be a great public benefactor.

POPLARS.

It has become the fashion to decry the recently introduced Russian poplars and to pronounce them valueless. I think it hardly time to do that yet. The *Certinensis* poplars, which, according to Prof. Bailey, is *Populus laurifolia* Ledeb, of botanists, is still one of the finest trees on my grounds. The two forms of *Populus balsamifera* *intermedia*, sent out by Prof. Budd as pyramid and laurel-leaved poplar, are doing well with us. Cuttings from them set out on the open prairie four years ago are making a satisfactory growth and, in fact, are as promising as any trees on the plantation. The black poplar of Europe (*Populus nigra* L.), which we received under the name of birch-leaved poplar, is doing well here and making a fine symmetrical growth. It seems to be very hardy. Bolles' poplar (*Populus alba* Bolleana) is a silver-leaved poplar of upright fastigi-

ate habit. It is a far handsomer tree than the common silver poplar and does not seem to sprout around the roots. It is said to grow very tall, and will be an acquisition here where the Lombardy poplar is not hardy.

WILLOWS.

These dry seasons have been hard on willows. *Salix Napoleonensis* has died outright. The laurel-leaved willow is afflicted with some fungoid disease that causes the young twigs to turn black and die.

The red willow (*Salix fragilis*) is thrifty so far as the original tree is concerned, but cuttings set on the open prairie have made little headway. The Russian rosemary-leaved willow sent out by the central station is a shrubby willow of iron-clad hardiness. The Russian golden willow is very promising.

LILACS.

The common lilac (*Syringa vulgaris* L.) has been cultivated at Montevideo for twenty-five years; the Persian lilac (*Syringa Persica* L.) has been cultivated nearly as long. These shrubs have beautiful clean foliage and attractive flowers and are never attacked by insects or by disease. They endure the severest cold without injury and are unaffected by the most protracted drought. Clumps and screens of lilac will make the most forlorn place look homelike and attractive within a few years. The shrub is of the easiest propagation and is surer to grow on the open prairie than a seedling box elder. All horticulturists know this, but upon the prairies of western Minnesota there are evidently thousands who do not. The white variety of the common lilac and the variety known as Chas. X both do well at Montevideo. *Syringa Josikaea* and *Syringa Japonica* both promise well.

PEA TREES.

The common pea tree of the Eastern nurseries appears to be *Caragana arborescens* Lam. It is more tree-like in its habit than the other caraganas, and as it grows at Montevideo it is very stocky and thrifty. The species sent out by Prof. Budd as *Caragana Redowski* is quite upright in its habit and a fine shrub. *Caragana frutescens* as it grows here is quite upright, while *Caragana mollis* is quite low and round-headed. *Caragana pygmaea* has a distinct weeping habit and is quite graceful. *Caragana variegata* has a mottled leaf, but the markings are not sufficiently distinct to be particularly objectionable. All the caraganas produce interesting yellow flowers in early spring. They are entirely hardy and in this prairie country a decided acquisition.

MOCK ORANGE.

There is much confusion in the nomenclature of the different species of *Philadelphus*. With us the common mock orange (*Philadelphus coronarius*) appears to be the least hardy. All the others do well. One of the most satisfactory shrubs in our collection is a *Philadelphus* sent out by Prof. Budd as 144 Voronesh. *Philadelphus Gordonianus* blooms a week or two later than the other species.

MANCHURIAN MAPLES.

The dwarf maple (*Acer ginnala*), sent out by Prof. Budd, maintains its record as one of the hardiest and best of shrubs.

HONEYSUCKLES.

I have nothing but praise for *Lonicera Tartarica*, and its variety *Lonicera Tartarica splendens*. They should be in every farmer's dooryard and in the border of every village lawn. Our native honeysuckle, *Lonicera glauca*, is a shrub that we prize greatly. It is even finer in cultivation than when growing in its native wilds. It is idle to plant on these Western prairies any of the climbing honeysuckles advertised in the catalogues of the Eastern nurseries. They are all tender. *Lonicera media* as sent out by Prof. Budd will climb and is hardy. *Lonicera Alberti* is a hardy narrow-leaved honeysuckle that needs some support.

PLUMS AND CHERRIES.

One of the earliest flowering shrubs is a cherry sent out by Prof. Budd under the name of *Prunus Maacii*. *Prunus padus* from Russia resembles somewhat our native choke-cherry but has graceful drooping branches. It produced a full crop of fruit this year. *Prunus pumila* is an interesting flowering shrub of value from an ornamental point of view. The Russian plums, 19 Orel and 20 Orel, and the Russian cherry, Bessarabian, have ornamental value. The leaves of the Bessarabian remain on the tree at the present writing. The Ostheim and Suda hardy cherries are doing well but have not produced much fruit. The little morellos have mostly succumbed to the drought.

SPIRAEAS.

The early flowering spiraeas are doing well with us. We especially like Van Houttii's spiraea, which is said to be a form of the Siberian spiraea trilobata. It is not difficult to succeed with many other species of spiraea, provided you have a water supply.

NINE-BARK.

The native nine-bark, which was called by botanists a few years ago, *Spiraea opulifolia*, has become by the requirements of improved nomenclature successively *Niellia opulifolia*, *Physocarpus opulifolius*, and is now re-christened *Opulaster opulifolius*. It would have to be endowed with superhuman intelligence to know its own name. It is nevertheless a fine shrub and one that ought to be found in every well regulated garden.

BUCKTHORN.

We planted on one of the driest of our bluffs a few years ago a few specimens of *Rhamnus cathartica*. It has survived. A neighbor has planted a quantity of it for a hedge. It appears to be doing well and may be safely planted anywhere on the prairies.

BURNING BUSH.

The native shrub, *Euonymus atropurpureus*, is one of the best lawn shrubs that can be planted in this state. The *Euonymus Europaeus* of the nurseryman is quite successful too but not so hardy as our native shrub.

RUSSIAN OLIVE.

The Russian oleaster which according to Prof. Bailey is *Elaeagnus hortensis Songonica* is iron-clad in hardiness and well adapted for hedges.

The buffalo berry (*Shepherdia argentea*) is especially desirable and equally hardy. The buffalo berry is dioecious, and in order to obtain fruit one must have both staminate and pistillate trees. Our trees proved to be all staminate.

RIBES.

Ribes Alpinum proves to be an ornamental bush of no mean merit. It produces in the middle of the summer a small red fruit of no great value. *Ribes aureum* is one of the most useful, early flowering spring bushes. The species marked 148 Voronesh as sent out by Prof. Budd does not differ very much from the old kind.

CORNEL.

The *Cornus sanguinea* has failed; and so has *Cornus mas*. Our native cornel, or kinnikinic, is very desirable and useful.

ELDER.

Our native red-berried elder (*Sambucus racemosa*) is with us an ornamental shrub of much merit. The common elder (*Sambucus Canadensis*) does not do quite so well. The golden-leaved variety of *Sambucus nigra* is of doubtful hardiness but grows strongly every year and blooms freely. It may be used where yellow tints are required to light up a dark shrubbery. (We have no dark shrubberies in western Minnesota). The cut-leaved elder is tender with us.

SNOWBALL.

Our common snowball grows well on the prairies of western Minnesota. A Russian variety, distributed by Prof. Budd, is of rather more compact habit and a freer bloomer. Our native *Viburnum lentago* is as fine a shrub as any country produces and succeeds admirably in cultivation on the prairies.

JUNEBERRY.

Lovett's Success Juneberry produces a full crop with us; the native Juneberry does nearly as well; they are both worth planting for their interesting white flowers and their soft velvety foliage in early spring.

PRIVET.

The Russian privet is doing fairly well with us. It holds its leaves late in the fall with us—and this is an important point in its favor, as almost everything that we are able to raise drops its leaves at the first severe frost.

BARBERRY.

The common form of *Berberis vulgaris* does well with us, producing plenty of yellow flowers and an abundance of sour red fruit. The purple-leaved form seems to be equally hardy. *Berberis amurensis*, from Prof. Budd, is growing thriftily with every prospect of success.

JAPANESE ROSES.

The white and red forms of *Rosa rugosa* both do well without winter protection. They are vigorous and desirable shrubs. *Rosa Wichuriana* is a creeping rose of great hardiness. A yellow rose sent out by Prof. Budd is equally hardy and in every way desirable. *Rosa spinosissima* succeeds without winter protection, as do some forms of *Rosa Damascena*. Winter protection is required for the hybrid roses, but they are as easily laid down and covered with earth as a raspberry bush.

CONIFERS.

With us the most hardy evergreen is the native juniper (*Juniperus Virginiana*). This tree is native to granite ledges near our place. The dwarf pine from the high mountains of Europe (*Pinus montana du roi*), commonly called the Mughe pine, stands next to the juniper in hardiness. It has been growing at our place about fifteen years. The dry weather of the last two or three years has killed the Norway spruce and the black spruce of the same age. The white spruce is still doing fairly well, and so is the Colorado spruce (*Picea pungens*). The Scotch pine is holding its own against all kinds of vicissitudes, and even the Austrian pine seems to be taking a new lease of life. Our *Pinus ponderosa*, from Mr. Wedge, is living, but all the young evergreens sent out from the central station for the last two years have died, except one white pine and one prostrate juniper.

APPLES.

The only trees we have in bearing are Maiden's Blush crab and Oldenburg. Among the young trees, the following all look well: Volga Anis, Hibernial, Lieby, Whitney, Sweet Russet, Greenwood, Virginia, Dartt, 987, 322, 984, 22 M, Smd. No. 1, 242, 4 m.

LA CRESCENT EXPERIMENT STATION.

J. S. HARRIS, SUPT.

Most varieties of fruits turned out better than I anticipated at the time of making my mid-summer report, although the season has not by any means been the most favorable one. The rainfall with us was very much less than the average, and we had more than the usual number of days of extreme heat.

The raspberry crop turned out to be very nearly an average one. No protection had been given the previous winter, but the canes were not seriously winter-killed. The Shaffer suffered the most. The Nemaha (black) and Cuthbert (red), proved the most profitable. A portion of the Shaffers had been left without pruning

out the old wood, and they came out better than the others. The season's growth of canes for next year has not been as luxuriant as usual. The cause is partly from injury by the May frosts and the extreme drouth that has prevailed during the autumn. The wood appears to be well ripened up, and I shall not give these winter protection. The setting of blackcaps in rows four feet apart and after the next season's crop is taken off removing every alternate row, has proved more profitable than planting the rows wider apart and raising catch crops between the first year; and with such seasons as the two last I am satisfied that it will not pay to hold a plantation for more than two crops. This year we are trying the plan of alternating the rows with reds and blacks with the view of removing the blacks as soon as they have done fruiting next year.

The currants bore an extraordinary crop, but the quality was not quite the best on some varieties owing to an injury to the foliage that caused it to drop before they were dead ripe. The Red Dutch and White Dutch suffered the most, and the Long Bunch Holland and Victoria the least; the North Star was slightly affected but not to the injury of the fruit, and it promises to become our most valuable variety.

The native plum crop was fair, the Cheney and Rollingsstone bearing to their fullest capacity and other varieties more or less. The Blackhawk was heavily loaded, but the fruit was small and poor in quality. The most promising of the newer varieties was Pifer's Peach. The blooming season was favorable for insects working in flowers, and they were thoroughly pollenized. Although the fruit was apparently frozen after formed, it was not injured, and we had no plum pockets.

The grape crop was nearly a failure from the effects of the May frosts. No mildew has been observed. The growth this season has been less than common.

The leading object of this station is the trial of the Russian apples, such of American varieties as have not been thoroughly tested and all new seedlings and novelties as fast as trees or scions can be procured. Our work in that line has always been experimental, and since 1856 several hundred varieties have been planted, and twice our orchard has been nearly annihilated from unfavorable climatic causes. Since the last calamity in 1884-5, our work has been exclusively experimental, and since 1880 plats and records are kept of everything that is planted. The orchard at present is in a very encouraging condition. The growth of the season has been fair and healthy, and most of the varieties have ripened up their growth early, though the buds of some started somewhat again this fall, but the soil being dry through the autumn I do not think they have started to an injurious degree. The greatest danger now to be feared is from root killing, as the ground is dead dry to a great depth, except an inch or two on the surface.

The orchard has not suffered very much from blight for two years past. About 150 varieties were planted this year, but as small trees suffered more from the May frost than larger ones a great many of the varieties did not mature more than from one or two to a half dozen

specimens per tree, and some of those showed frost marks. Many of the older orchard trees, or such of them as did not bear heavily the previous year, bore heavy crops. Those bearing the best and that carried their fruit to maturity were the Tetofsky, Oldenburg, McMahon White, Wealthy, Plumb Cider, Haas, Perry Russet, Utter, Ostalky, Antonovka and a few seedlings; and of the Siberians, Transcendent, Hyslop, Alaska, Pride of Minneapolis, Orange and an unknown variety. Some other varieties of Russian origin started in for a full crop but continued to drop off during the entire summer and eventually none came to full maturity. The varieties were the Autumn Streaked (which is also a terrible blighter), Early Glass, Red, Yellow, Striped and Kourk Anis; the only one of the Anis found doing fairly well is the Russian Green. With us they have been behaving in this manner for several years. The fruit is hardly medium in quality, and none of them are good keepers, and we pronounce them as unworthy of cultivation in southeastern Minnesota. True, we cannot tell what they may do as the trees get older, but for the first fifteen years after planting one Oldenburg or Wealthy tree will bring more fruit than any six Anis that we have so far tried. The Arabian fruited with us this year for the first time. The fruit is large and showy, hangs to the tree well and will doubtless rank high for cooking. Season, early winter. The trees appear to be hardy and healthy and very free from blight. One tree of Peterson's No. 5, a seedling from the Hibernial, fruited this year at four years old. It promises to be better fruit than the Hibernial.

In the orchard grounds set apart expressly for the experiment station, about 50 trees were planted in 1890, 50 in 1891, 60 in 1892, 30 in 1893, 30 in 1894, 130 in 1895, making a total of 350. Of this number not a single tree has been injured by sunscald. Trees that failed to live have been re-set with same varieties. In 1890, but one failed to live; in 1891 and 1892, one failed to live; one in 1893, and four were killed by borers; in 1894 two died; and in 1895 about twenty died or are in a condition that makes them worthless—these were badly root-killed in the nursery before being taken up. A tree that has been injured in the roots should not be disturbed until it has had time to make plenty of new roots. The principal varieties are Red Queen, Zuzoff, North Star, Early Duchess, Longfield, Arabian, Lord's Apple, Patten's Greening, Iowa Beauty, Ostrekoff, Adaline, Sweet Pipka, Skrout German, Okabena, Stepka, Antonovka, Noble Red Streak, Yellow Sweet, Revel Glass, No. 515, 3m, 30m, 64ver, or Muscatel, Allen's Favorite, Saccharine, Gruskovka Slandka, No. 1056, Dairy, Hotchkiss, Peerless, Blue Anis, Borsdoff, Clark's Orange, Red Betenheimer, Garden, Gettman, 3T, Borovinka, Wax, Nathan's Russet, Jenny, Johnston, Wis. Spy, Victor, Pearce's Unknown, Czar's Thorn, Peterhoff, Vinesse, Catharine, Anisette, Holdfast, Ostrohoe, Vasil's Largest, G. Swedenser, Miller's Jannett, Romna, 20m, Wilcox No. 2, Roman Stem, Wolf River, Northwestern Greening, Mary, Peterson No. 5, Sandy Glass, No. 224, Golden Reinette, Sklonka, Good Peasant, Boydonoff, Cross, Murphy's Greening, Repka, Gilbert, Newell, Raspberry, McGowan, Philip's No. 1 and No. 3, Christmas, Avista, Dabold, Charlamoff, Brett No. 1,

Enormous, Page's Winter Sweet, P. J. Kniss, Hibernial, Loyna, Lord's, Longfield, Anisim, Red Wine, Juicy White, Glass Green, three Rus-sions with names lost and about a dozen seedlings not yet fruited and five varieties of Douglass seedlings. Besides these we have in crabs Martha, Stoddart, Sweet Russet, Choke Cherry, Rutland Beauty, Virginia, Tonka, Dartt's Hyb., Estaline and a sweet variety without name—together more than one hundred varieties of apples and crabs. Up to the present time we have not done much in the line of top-working, but having a stock of Virginia and Trenton crabs on hand shall begin experiments in that line. We have this fall chopped off a piece of ground on the north side of a high bluff where we expect to plant 200 trees next spring. The holes are dug but the ground will not be plowed but will be kept mellow about the trees by digging and heavy mulching.

EXCELSIOR EXPERIMENT STATION.

H. M. LYMAN. SUPT.

This has been an unproductive year for apples at this station. The season started out well with an abundant bloom, and the trees never looked more promising for a large crop of fruit, but when the fruit had attained about the size of a small crab it nearly all fell to the ground. Such was the fate of Duchess, Martha crab, Transcendent and several other varieties, while most of my seedling trees that had borne fruit before carried their fruit well. I can hardly attribute the loss of fruit to the frost, for those on higher ground suffered equally with, if not worse than, those on low ground. I know the frost thinned out many of the blossoms on both high and low ground, but there appeared enough left for a full crop. Was it a kind of blight which caused all those Duchess to cast their fruit? There has been more blight here the past season than for several years. Among those that suffered most were: Pride of Minneapolis, Hibernial, Longfield and Yellow Transparent. All of Dartt's Hybrid and Lake Winter are dead. The Wealthy passed through the season with little blight. The Martha crab and Peerless seem very free from blight.

I have planted out several thousand root grafts the past season. Many of them are from seedlings of much promise, the original trees having passed through one or more of the severe winters.

Our worst enemy now to apple growing appears to center in the blight more than in cold winters. Now is about the periodic time to expect another series of blighting years, I think.

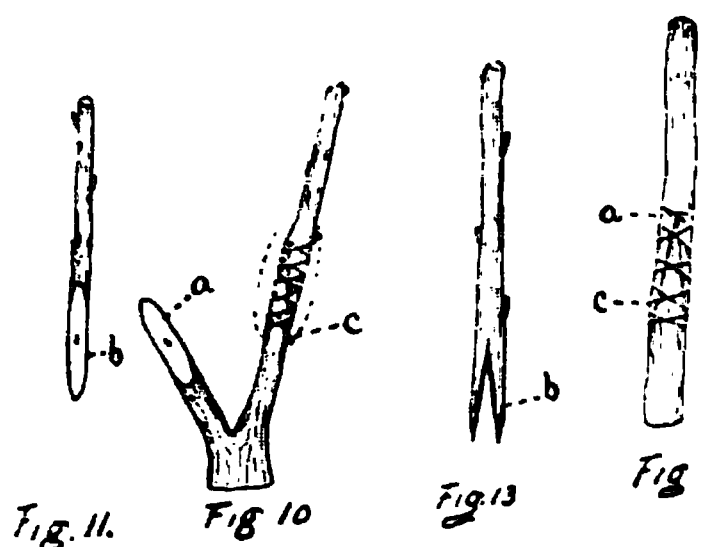
The dominion government recently enacted a law prohibiting the spraying of fruit trees while in blossom under penalty of heavy fine. The moving spirits in securing this legislation were the beekeepers, who find that spraying trees in bloom seriously interferes with the quantity and quality of honey gathered by the bees. The same complaint has come from many sections of the United States. As a matter of fact, the interests of beekeepers and of fruit growers in this matter are identical. Bees aid in fertilizing the flowers and therefore in securing a good set of fruit, while no good is derived spraying until the blossom is nearly or quite all gone.

GRAFTING, CONCLUDED.

J. S. HARRIS, LA CRESCENT.

We have been disappointed in our anticipation of the season, vegetation at this date being more forward than we expected, or we should have finished this subject last month. But the methods presented in this paper may be practiced with safety later than the others and can be used where the others would fail.

Splice Grafting.—Splice grafting is perhaps the simplest of all the methods. The scion and stock are cut across diagonally precisely as for tongue grafting, that is, with a sloping cut upward on



the stock (a fig. 10) and downward on the scion (b fig. 11), but no tongue is made to interlock and hold the two together. Then the two parts are made to fit precisely, so that the inner back of one corresponds with the other, at least on one side, and are firmly bound together with a strand of matting or cotton yarn (c fig. 10) and finished by covering the union well with grafting wax; or the binding material may be omitted if covered with waxed cloth. This method is particularly adapted to the grafting of soft-wooded and pithy plants.

Saddle Grafting.—In saddle grafting the top of the stock instead of the scion is cut in the form of a wedge by making a sloping cut upward on opposite sides one inch or more long and coming to a point at the center (a fig. 12). The scion is prepared by splitting the lower end and usually thinning away each half on the inner side to a tongue shape (b fig. 13) (for root grafts that is not necessary), and fitting the two, at least on one side, as in tongue grafting (c fig. 12). The scion is tied in place, and the wound waxed over, as in splice grafting. This method offers double the surface for the junction of stock and scion, is practical with soft, pithy and succulent wood, where other methods would fail, and by shading with paper bags tied over until the union has taken place may be practiced on growing plants until the season is well advanced.

Side Grafting.—One other method that I have practiced to considerable extent, and very successfully, is side grafting. It is adapted to stocks, five-eighths to one-half inch and even a little more or less in diameter. The scions are prepared as for cleft grafting with a smooth thin wedge at the base, care being taken to have a bud on one side just at the top of the wedge. A diagonal cut is made in the stock (a fig. 18) (see cut on page 157, April No.) one to one and one-half inch in length and not extending beyond the center. The stock may be cut off at the time of the operation about three-sixteenths of an inch above the top of the cut, but, we think, except for root work it is better to leave a stub two or three inches long to be cut away close to the graft after it has made a good union (see dotted line in cut). After the graft is in place (b fig. 18, page 157), wind about it very firmly a strip of waxed cloth to hold it in

place and keep out air and water, or tie and cover with grafting wax (c fig. 18). We have found this method the very best for plums, and with slight modifications it can be practiced to get branches on trees at any point where wanted. It is also adapted to the grafting of evergreens, but not quite as well as veneer grafting, which differs from it only in sharpening or wedging only one side of the scion to the center and cutting away a corresponding piece on the stock as long as the flattened part of the scion, making it square at the bottom; binding and waxing the wound the same as in side grafting, and shading with paper bags until the parts have united.

I have endeavored to make the articles on grafting as plain and simple as possible, and believe that after a careful study of them and a few experiments almost any person may become an expert grafter. We are indebted to "Farm, Stock and Home" for the cuts used in illustrating the methods.

The Abronia is a very pretty annual with long, trailing stems, bearing in great abundance clusters of verbena-like flowers of great fragrance. The colors are very delicate, and they remain in bloom a long time. Arenaria is a waxy yellow and Umbellata a delicate lilac with white center. The seeds are enclosed in a husky covering, which must be removed before planting.

FORESTRY AT THE SCHOOL OF AGRICULTURE.

PROF. S. B. GREEN, ST. ANTHONY PARK.

The subject of forestry is regarded as one of the most important in the course of study in the School of Agriculture. Its object is to familiarize the students with the habits and value of our common native trees and those introduced trees that are of special economic importance. In considering trees, the points taught are their hardiness in the various sections of this state, the locations and soils for which they are especially adapted, their value for timber, for windbreaks and for ornamental purposes, and the methods of distinguishing and propagating them. Other phases of this subject that are studied are windbreaks and groves for the prairies and the best methods of forming them under the various conditions that exist in this state, the past and present conditions of our timber supplies and the best methods of perpetuating the logging industry in Minnesota, including the best way of dealing with the forest fire question and the effect of forests on climate, including their effect on the water that falls on them.

The students are required to study the trees themselves in the nursery, forest plantation and on the grounds of the Experiment Station, and make several excursions to nurseries and plantings in the vicinity of the school. The subject is also illustrated by charts and the stereopticon. The photograph herewith reproduced was taken of the class in forestry in the nursery.

Prof. S. B. Green's class in forestry at the Minnesota State Agricultural School, St. Anthony Park, Minn.

PROTECTION FROM FROST.

SUCCESSFUL EXPERIMENTS IN CALIFORNIA.

George A. Fleming, of Visalia, profiting by a paper recently written by W. H. Hammon, forecast official of the United States Weather Bureau here, made an experiment during the recent cold snap and succeeded in protecting the fruit growing on his 400-acre farm from any damage by frost. His neighbors' crops, which were unprotected, suffered quite seriously.

Hammon's method was somewhat of an improvement over the one recommended by Finkle, of San Bernardino. The latter advised the use of large vats of water with fires built around them to produce condensation. Hammon suggested the use of small fires, sprayed from time to time. The large fires recommended by Finkle, he thought, would produce an up draft carrying the moisture too high to do any good. In turn Fleming has improved on Hammon's idea. His method is described in a letter written to Hammon and received yesterday. The letter reads as follows:

"Dear Sir:—Your valued favor of the 3d inst. relative to protection from frost received. Thanks for valuable information conveyed. Have made use of it to our great advantage three times during the latter part of last week. Damage is reported within a few miles of us where no effort at protection was made, but can discover no evidence of frost here at all. Almonds, early plums, apricots and peaches, all of which either in blossom or already formed, escaped the slightest injury.

In endeavoring to carry out your idea of evaporating as much water as possible with the least amount of rising heat, we used several plans. We could not spray water on our fires, as, in order to make evaporation continuous, it required a man to attend to each fire. We burned brush beforehand on our avenues and open spaces, and the beds of live coals formed were smudged with wet straw and manure several hours before sunrise and kept wet. This could not be done among the trees without danger of burning them. We therefore heaped wet straw on a wire network four feet square, stretched from four stakes driven into the ground, the straw being about one and a half feet from the ground. Small fires were built under them, and a man could attend to several, occasionally replenishing the fire and wetting the straw.

But we finally hit on a still better scheme. We built similar wire frames on our low truck wagons, stretching them from four wagon stakes and heaping wet manure over them. Dirt was thrown on the wagon beds to protect them, and pots of burning tar were set underneath the straw roof. A barrel of water on the wagon was used to keep the straw wet. These wagons were driven about and did the best work, as they could go wherever most needed. The smoke and vapor were carried to the rear as the wagon moved, and being at once out of the rising heat, fell close to the ground in a long white trail. At daylight our whole 400 acres of orchard was covered with a white fog extending from the ground about twenty feet high.

It looks now as if one *could absolutely protect* against any ordinary frost, and if so you will have earned our everlasting gratitude." —San Francisco Weekly Chronicle, March 12th, 1896.

The above selection was contributed by Chas. Y. Lacy, whom our old members will remember as secretary of this society during the five years from 1880 to 1885. His present residence is at a postoffice in Montana bearing his name. We hope to hear further of him.—Secy.

RESULTS OF IRRIGATION IN SOUTH DAKOTA.

A. F. HUNTER, REDFIELD, S. D.

I will confine myself to the results obtained on the Hunter-Salzer farm at Mellette, S. D. As most of you are aware, we conducted an experimental station there during the past season, 1895, with most satisfactory results; in fact, we were all surprised at the wonderful success of the experiment. We find that all kinds of grain, vegetables, grasses and forage plants usually grown in Illinois, Iowa, Wisconsin or Minnesota, can be grown most successfully here. With irrigation we are sure of as large a crop every year as they are in their best season, and I find in traveling through these states that they have their poor years as well as Dakota. The land used for the experiment has not been irrigated since the fall of 1894, and has retained plenty of moisture since, thus showing that it is possible to grow two good crops with one application of water. This is where we have a great advantage over countries where they have to irrigate several times each season. Our black loam and clay subsoil holds the moisture a long time, as we have no sub-drainage, and our evaporating season is short. One piece of land irrigated in the fall of 1893 produced sixty bushels of oats in 1894 and thirty-four bushels of wheat in 1895; last fall it plowed up nice and moist, and I expect will grow a good crop of potatoes in 1896 without irrigating. The fact is, if we have any moisture in our subsoil, we have rain enough to grow a crop every year. The result of irrigation the past season was 34 bushels wheat per acre, $78\frac{1}{2}$ bushels oats, 210 bushels potatoes, 3 tons millet, corn only about 30 bushels as we were late in planting, and most of it got frosts early in the fall; unirrigated wheat 12 bushels, oats 20 bushels, corn 10 bushels, millet $\frac{1}{2}$ ton, potatoes 60 bushels.

The largest yield of wheat on the farm was $37\frac{1}{2}$ bushels to the acre in 1893, it being irrigated about the time it began to head. The smallest yield was 34 bushels in 1895, on land irrigated in the fall of 1894. Oats on this farm in 1894 averaged 60 bushels per acre from fall irrigation. In 1895 they were irrigated during the growing season and averaged $78\frac{1}{2}$ bushels. I believe that the yield of both wheat and oats would have been larger if we had used more seed. This year we will seed $1\frac{1}{2}$ bushels of wheat and $2\frac{3}{4}$ bushels of oats.

The best results were obtained from potatoes by irrigating them when in blossom. Water should be run between the rows and not allowed to get up on the vines. They should be cultivated as soon as possible after applying the water to prevent the land from baking. As irrigation prolongs their growth, late varieties should be planted early to mature before the fall frosts. The same thing applies to corn—it should not be irrigated late in the season, and early varieties should be used. I believe in fall irrigation for grain or after it is up high enough to shade the ground. Potatoes, corn, and all hoe crops should be irrigated during the growing season and then cultivated. Deep plowing brings best results.

Irrigation is no longer an experiment in South Dakota. Our farm of 800 acres will pay six per cent on a valuation of \$60 per acre. It

more than paid it the past season. Ten dollars per acre will put our prairie lands under a most complete system of irrigation. There is more water in South Dakota today than there are farmers who know how to use it, and many will fail to spread the water over much land the first year. They must not be discouraged. My advice is to build a good reservoir first, then make your ditches as you need them, arrange your crops so that you always have land to use the water on. Keep the wells going night and day. Every time you have a good head of water in the reservoir, spread it on the land—don't pay any attention to rains. Do not irrigate the same piece of land twice until you have gone over your whole farm. After you have irrigated a field once, it is much easier to do so the second time, because you know how to handle the water, and the land does not require as much.

Do not try to spread water unless you have a good supply in the reservoir to work with. Make a large opening in the ditch and rush the water over the field. This is the secret of successful irrigation on level land.

CONSTRUCTING STORAGE PONDS FOR IRRIGATION.

In connection with pumping plants, storage ponds are being mostly used and are made on the flat surface of the ground. If the land is in sod, remove all the sod from the ground on which the embankments are to be constructed, otherwise a seam will always remain through which water would escape from the reservoir. When the outlines of the embankment have been established and the sod removed, plow within the proposed limits; then with a scraper draw the earth from the inside of reservoir and with it form the walls. The walls should not be less than five feet high and very thick at the ground level. Carry them up so that the slope from the inside will be very gradual, for if the walls are nearly perpendicular wind waves will destroy them. The outside of the walls can be more perpendicular. Having built the walls by using the earth from the inside of the reservoir and with everything ready for puddling the earth to hold water, plow the entire bottom of the pond four or five inches deep, then with a harrow or other suitable implement pulverize the earth finely. Everything is now ready for puddling. Turn in the water and begin to puddle at one edge. Work carefully until the earth has been reduced to mortar. Continue until the entire bottom has been completed as far up the embankment as can be worked to good advantage. It may very often happen that puddling is out of the question because of the porous condition of the soil. If it is sandy, haul into the basin several loads of any kind of clay and mix this thoroughly with the earth. Fresh manure or even sawdust may often be employed to just as good advantage. Frequently it is necessary to run muddy water into the basin and allow the sediment to find its way into the loose sand. Of course, the more clay there is carried into the muddy water, the more effectual will be the puddling. This method proved successful in a

very leaky lake, excavated in an old creek bottom composed almost entirely of coarse, loose sand. In constructing these surface storage basins, the dimensions are best when 50x100 ft. or 100x200 ft., etc., rather than square. A pond 50x100 ft. and containing five feet of water will irrigate 25 acres. The whole plant including a first-class wind engine should not cost over \$250. It is a good rule to have the pond of such size that it will not be necessary to empty it oftener than once or twice a week. That would make the water supply at hand the main factor in determining the size of the pond. Figure it out in this way: One gallon contains 231 cubic inches. A space 231 inches high, covering 10 square inches, equals one gallon, and one square foot or 144 square inches equals 14.4 gallons. Now divide the number of gallons which can be pumped in three days' steady wind by 14.4 and the result will be the number of square feet necessary for the bottom of a pond two feet deep; one-half that number will be sufficient for one four feet deep.—*Orange Judd Farmer*.

May Calendar.

J. S. HARRIS.

At this season, as a rule, work develops much faster than it can be done. The first ten days of April gave indications of a late, backward spring, and digging and planting of trees could not be done. The next ten days gave us excessive heat for the time of year and much wet weather when the soil could not be worked to advantage and pushed vegetation rapidly, and, consequently, many varieties of trees cannot now be taken up and transported long distances and transplanted with safety. But fortunately many of our larger nurseries have facilities for keeping trees dormant till quite late in the season. Those who have yet to procure trees for planting should procure them as near by as possible and in no case trust to their transportation by freight.

When trees are a long time in transportation they often become heated, and the buds will put out a feeble growth several inches long. The only remedy in such a case is severe cutting back and keeping them shaded from the hot sun until a healthy circulation gets started. In other cases trees arrive dried and shriveled, and if planted out without any previous preparation a good share will be lost, but with a little care they may be saved. Unpack such as soon as received, open a trench and bury the whole, roots, top and all, and leave them several days or a week. When taken out, they will be found plump and about as good as new.

Trees grown at home may be taken up and replanted until the foliage is considerably expanded, but the roots should not be long

out of the ground, and the work had better be done at evening. Great pains should be taken to have the soil fine and well formed about the roots, and mulching should be put over the surface at once, and if the trunks of the trees are wrapped with strips of burlap, cotton cloth, rags, straw or paper for a few days, it is still better and may prevent sunscald.

In no case should pruning be done during this month, except shortening the tops of trees as transplanted to correspond with the roots, and cutting back budded stocks, if not already done, to within about three inches beyond the bud.

Spraying with arsenites for the destruction of insects should be done as soon as the blossoms have fallen and the fruit is set. Jar-ring for plum curculio and catching the insects on sheets and destroying them is more effectual and safer than spraying. The work of putting out root grafts should be finished up at once, and cuttings of currants, grapes and many shrubs may still be set with safety, but they must be in well worked, rich soil, and the earth pressed very firmly around the base. Grape vines should be fastened to the stakes as soon as the buds have got to the size of large peas.

Raspberries and blackberries should be up and in place for fruiting, and the cultivator run between the rows at once, and two or three times later before the summer mulch is applied.

Early May is the best time for setting new strawberry beds. In cases where it cannot be done until later, it should not be given up until another year. By using care plants may be dug and set during the entire month. If plants are dug early and properly trimmed and heeled in or carefully set two inches apart in rows and the blossoms kept pinched off, they may be taken out and set with safety until the first of July.

Work is pressing in the kitchen garden, and the question is what to do first. New asparagus beds should be made as early as possible. Old beds should be kept clean, and the shoots should be kept cut or broken off clean during the season of use, as soon as six or seven inches high. That for market should be put up in neat bunches about three inches in diameter and the lower ends cut square. Tie with two strings, one near the top and the other near the bottom.

All hardy vegetable seeds may now be planted, but lima beans, squashes for winter, melons and such like had better be delayed until about the 10th of the month or later.

Cultivating, hoeing and weeding are essentials to success both in fruit and vegetable gardening and should begin with the season.

To get rid of perennial weeds, they must first be prevented ripening their seed, and then the plant itself must be eradicated. Where it is possible, they should be pulled up; if small, keeping them cut off will eventually kill them.

Your Corner.

I notice your question on page 166 of the April Horticulturist referring to tightening trellis wire, and will give you the mode that I have used for quite a long time. Starting at one end, I drive four staples (about one-half inch long) into the post, letting them stand out far enough to pass the wire twice around the post. I commence by passing the wire through the staple next to the vines, pulling the wire tight as I can, and having come to the fourth staple, and the wire tight, drive that staple so that it holds the wire. The end of the wire is now bent back, an extra staple being put in to make certainty sure, and I go to the various posts on the line and place the wire in its proper position and drive the staples to hold the wire, leaving them far enough out that the wire passes through freely, and so on, till I come to the last post. There bore a hole about one-half inch in diameter where you want the wire, and take an iron hook, say twelve or fourteen inches long and about three-eighths inches thick with a thread about one-half the length of the hook, on which goes a good large washer and nut; pass the hook through the hole, put the washer next the wood, and the nut just enough on to be sure it holds, which leaves most of the hook on the side next the grapes. Now pass the wire on the hook and have it as tight as a good, strong man can comfortably pull it, then take your monkey wrench and screw the nut up till the wire is as tight as you want it. In the fall of the year unscrew the nut till the wire is loose, or something will have to give way on account of contraction. Try one trellis and let me know if it meets your approbation. JNO. PRICHETT.

Alexandria, Minn.

FRUIT PROSPECTS.

My orchard is in fine shape for a large crop of apples—trees budded full. J. A. HOWARD.

Hammond, Wis., April 19, '96.

Strawberry and other plants and trees wintered good. Plenty of moisture in the ground, and we ought to have a good crop of fruit, but it is really a month too early to tell anything about it.

Windom, April 21, '96.

DEWAIN COOK.

"I spent yesterday pruning in my orchard, and I never saw so many healthy buds at this time of the year. Barring frosts and insects, the crop ought to be immense." A. J. PHILIPS.

April 9.

While roaming over the orchards of the state last winter, I observed that the trees everywhere, both plum and apple, were full of fruit buds. If no untimely frost visits us—and we of the North are very exempt from such calamity—we may confidently expect another '92 crop. May I be permitted to urge with greatest emphasis that all who have trees that they value do something to prevent overbearing and the resultant check to the vitality of the trees, as well as loss of the next season's crop?

CLARENCE WEDGE.

Albert Lea, April 25, '96.

Apple trees are well filled with fruit buds and the bloom promises to be unusually abundant. Plums and cherries the same. No varieties have received injury from the winter. Grape vines that were cut back by the May frost last year did not produce as strong and vigorous fruiting canes as usual, and the prospect is for only about 80 per cent. of an average crop. Many strawberry plantations suffered severely from summer and autumn drouth and went into winter with feeble roots, but have wintered well and are improving rapidly, and indicate about three-fourths of a full crop. The fruiting canes of raspberries and blackberries did not make a heavy growth last year and only about two-thirds of a crop may be expected.

J. S. HARRIS.

La Crescent, April 21, '96.

Apples and plums appear to be perfectly healthy, and prospects for a good crop were never better. Pears (protected) are in perfect condition. Plums, European and Japan, also laid down and covered, are in fine condition—the Japans are in better shape than some of the Russians (also protected), the ends of the limbs of the Russians being somewhat injured. Peaches have not come through so well as the plums and pears. Some few strawberries uncovered have stood the winter. Raspberries, Philadelphia and the blackcaps, in good condition. Roses, though well covered, mostly killed.

Mr. Wedge should charge the "lack of thrift and vigor" of the trees seen here more to the unfavorable weather of the last two years than to the fault of the soil.

JOHN R. CUMMINGS.

Washburn, Minn., April 16, 1896.

THE "TOM THUMB" OF THE TREES.—The midget of the whole tree family is the Greenland birch. It is a perfect tree in every sense of that term and lives its allotted number of years (from seventy-five to one hundred and thirty) just as other species of the great birch family do, although its height under the most favorable conditions seldom exceeds ten inches. Whole bluffs of the east and southeast coast of Greenland are covered with thickets of this diminutive species of woody plant, and in many places where the soil is uncommonly poor and frozen from eight to ten months of the year, a "forest" of these trees will flourish for half a century without growing to a height exceeding four inches.—Lumber Trade Journal.

Secretary's Corner.

A CORRECTION.—On page 116, of the March No., the reporter makes Mr. Collman say that he used "thirteen teams three weeks" in making his reservoir. As it was really the work of three teams only and the reputation of the working ability of Iowa horses is considerably at stake, we hasten to set it right.

STATE FAIR PREMIUM LIST.—The premium list for the 1896 fair is now in press, and a copy will be sent to each member of the society. If any one fails to receive one, address Sec'y E.W. Randall, Hamline, Minn. A comparison with last year's list will show that the premiums on fruit have been raised in the aggregate about 20 per cent.

PORTRAIT OF PATRICK BARRY.—Through the courtesy of the Stetcher Litho. Co., of Rochester, N.Y., we are enabled to present to you in this number a fine portrait of the late Patrick Barry. Mr. Barry has been dead now five years, having passed away June 23, 1890, but he occupies an enduring place in the annals of American horticulture.

NOTICE OF SUMMER MEETING.—The June number will probably contain the notice of the summer meeting, and as the exact date will depend as usual on the time of ripening of the berry crop, it cannot be announced long beforehand. This will cause delay in the issuance of this number, and it may not be expected until towards the middle of the month.

CAN WE PROTECT AGAINST FROST?—The selection in this number on this subject, contributed by Ex-Secretary Lacey, contains the account of experiments looking to this end, involving an entirely new principle in its special application, viz., that a cloud of steam being heavier than the surrounding air settles to the ground, unlike smoke, which rises and is lost. This new plan should be on trial nearer home this season and reported on.

STATE EXPERIMENT SUB-STATION.—The second one of the sub-stations provided for by the last legislature, to which reference is made by Prof. S. B. Green in his Central Station report, in this number, has just been located about two miles from Grand Rapids, in Itasca county. This northern location will be of special interest to horticulture, as the attempts of private planters in that portion of the state so far show a remarkable adaptability to the culture of small fruits.

MASS. FRUIT-GROWERS' ASSOCIATION.—The fruit growers of the old Bay State have organized an association under the above title, which at the age of one year numbers one hundred and fifteen, "all practical fruit growers, and another year we expect to double the number," as writes Prof. S. G. Maynard, of Amherst, the secretary. This society will doubtless supplement in an efficient way the work of the Mass. State Horticultural Society, which probably more than any other in this country is developing the esthetic side of horticulture.

RENEW YOUR SEED.—"Reported experiments, made on a large scale and with many kinds, show that all varieties of potatoes rapidly deteriorate in yield, size of tubers and vigor when planted continuously at the University farm." So says Prof. S. B. Green in Bulletin No. 45, just issued by the Minnesota Experiment Station, St. Anthony Park. This number is devoted entirely to horticulture and talks about potatoes, tomatoes and variety tests of small fruits. These bulletins will be sent to any one on application, and every member of this society should have the opportunity to study them.

STRAWBERRIES FROM TEXAS IN MARCH.—An experiment that our old friend, Amasa Stewart, now of Lamarque, Texas, tried of shipping strawberries to Minnesota in March last resulted so successfully that a number of his old friends within easy reach had the pleasure of eating strawberry shortcake at that inclement season—it snowed all that day. There are, it seems, compensating advantages in living in that far away south state in that one can supply one's friends with this delightful luxury at a time when it can be most highly appreciated. This experiment was so much of a success, we are in hopes it may be repeated.

"THE WISCONSIN HORTICULTURIST."—The initial number of this monthly magazine issued by our sister society is received. It is quite similar in name, size, form and advertising features to our own periodical, and is a very creditable beginning for what we believe will prove to be an exceedingly useful undertaking. We notice, as an advantage, that all the articles as well as discussions are printed in coarse type, which would not, however, be practicable for us with the amount of matter that must be used. Sec'y A. J. Philips, whose address is West Salem, Wis., tenders to members of this society the same courtesy we offered them and will send their monthly to any of our members for 50 cts. per annum. Sample numbers will be furnished on application. We wish all possible good things to our Wisconsin brothers and sisters in this new enterprise.

HISTORIC TREES FOR ARBOR DAY PLANTING.—On Arbor Day in Penn., April 10th, the governor of that state planted on the campus of the state university a tree which is a shoot from the original "Penn treaty elm." This tree was a remarkable one aside from its historic interest, as it measured twenty-four feet around the base, one branch extending toward the Delaware 150 feet. It was blown down

in 1810. A shoot from this tree, which had attained a size of seventy feet in height and thirty inches in diameter, was removed in 1892 a distance of 175 miles and is thriving. If "pedigree" trees grown from shoots or scions taken from trees of such historic interest could be planted on the grounds of our public schools on Arbor Day, the occasion would acquire new significance, and the presence of such a tree would exert a living and subtle influence in fostering a spirit of patriotism in our youth. The tree above referred to is now on the grounds of Gen. Paul A. Oliver, Wilkesbarre, Pa.

N. J. HORT. SOCIETY REPORT, 1896.—The report of the January, 1896, meeting of this society is a neat paper-covered volume of 165 pages. While not as a whole of special value to the horticulturists of Minnesota on account of the different climatic and other conditions, one talk and discussion therein by J. E. Hale, of Conn., on "Peach Culture" will be found very helpful from the clear enunciation of general truths it contains. Mr. Hale is probably the largest, at least the best known, peach grower in America. His success he rightly ascribes to *thorough* work and absolute honesty. His brand on the cover of a case of fruit is an absolute guaranty that the top layer is a good one and the bottom layer and each between just as good as the top one. The one most important practical lesson connected with the marketing of the fruit received from this discussion is the importance of absolutely reliable work and of building up a reputation on this basis, not only because it *is honest*, but it is the only common sense way that pays in the long run. This course is just as practicable to the small grower as the large. Send your fruit to market in such a way that your name alone will sell it, and you will have no trouble in getting the *highest* price and have besides the infinitely greater satisfaction of feeling that you hold an equally high place in the esteem of those who know you.

NUT CULTURE IN THE UNITED STATES.—Our library has just received a valuable addition in the shape of an elegantly printed 144 page quarto volume under the above title, issued by the division of pomology, U. S. Department of Agriculture. It covers thoroughly the subject of which it treats, and in a very practical and not too technical way contains complete instructions as to the cultivation of the various species of nuts which can be grown in our country. The writer has put into clear language the composite information of a large number of workers in this field, using often their exact words. The volume is handsomely illustrated. The labor of preparing the material for this book was largely done, we are informed, under the management of the late pomologist of the department, Hon. H. E. Van Deman, a large part being done by himself personally, although not issued till now for lack of funds. Were this the only thing accomplished during his administration, there would still be good reason for commending him as a valuable public servant. But Mr. Van Deman is well remembered for other services and especially here for his recognition of the interests of pomology in the Northwest.

A HORTICULTURAL LAW SUIT.—A law suit of much importance to horticulturists in Minnesota, and probably in the whole country, has lately been begun in New Ulm, Minn. It involves a question as to the identity of a seedling being propagated by C.W.H.Heideman, of New Ulm, with one owned and originated by H. Knudson, of Springfield, a neighboring town. Mr. Knudson claims that the seedling Mr. Heideman is propagating is in reality his (Knudson's) seedling, scions from which he gave Mr. Heideman some years before—which latter fact Mr.Heideman admits,but claims they did not live.

The suit is for the purpose of securing a permanent injunction against Mr. Heideman to prevent his selling any trees or scions grown from this particular seedling. Mr. C. W. Sampson, of Eureka, is interested with Mr. Knudson in this suit, having become a part owner of stock to be grown from the original tree.

A temporary injunction has been secured by the plaintiffs by presenting affidavits from Prof. S. B. Green and Mr. Clarence Wedge showing in substance the improbability that two plants differing so widely as in this case from the original species and originated by different persons working independently should be so apparently identical.

The trial and decision of this case will be looked for with much interest. The result will depend very largely on expert testimony as to the identity of the trees and the improbability referred to in the above affidavits. The case also involves a very important question as to the rights of originators of new kinds of fruit.

The plaintiff's attorneys state that there is no statute, either of the United States or of the state of Minnesota, protecting the propagator of a new variety of fruit, and while they are of the opinion that the common law can be invoked to protect such a person, it seems strange that such rights are not clearly defined and protected by statute. The discovery and propagation of new hardy varieties of fruit in Minnesota is certainly of as much importance as the invention of some new machine, and our legislature should be called upon to pass a law upon the subject which will give protection in such matters, similar to the protection given by trade marks and patent laws.

The seedling referred to above is the new hybrid sand cherry of Mr. Knudson, a very interesting and, probably, valuable cross between the Miner plum and the sand cherry. It is fully described on page 132 of the April number of this year.

A very pretty annual, and one not generally cultivated, is *Nicotiana Affinis*. The flowers are clear white, tubular in shape and borne in great profusion. It blooms in the evening and is very fragrant, filling the atmosphere with its peculiar odor, which is similar to that of *Lilium Longiflorum*. The flowers remain fresh for several days after being cut if kept out of the sunshine.

Minnesota Fruit Exhibit at the New Orleans Exposition, Winter of 1884-5. Mr. F. G. Gould, the Superintendent, appears rather indistinctly, at the left.

THE MINNESOTA HORTICULTURIST.

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NO. 6.

In Memoriam.

FREEMAN G. GOULD,

EXCELSIOR, MINN.

Died May 9, 1896, aged 62 years.

Mr. Gould had been for some years a sufferer from a very trying disease, which terminated after a short period of intense pain in a tranquil death at the dawn of day, May 9, 1896.

No member of this organization was probably better known among its membership, and few have exerted a more wholesome influence on the horticulture of our state than the deceased. His name appears on the roll of this society as early as 1872—for some time previous he had been engaged in the nursery business at Excelsior. In the year 1889, his valuable services were recognized by making him an honorary life member. His name appears upon the roster of officers as a member of the executive committee during the years 1879, 1880, 1881, 1882, 1883, 1887 and 1888; as vice-president in 1883, 1884, 1885 and 1886 and as treasurer in 1895 and 1896, the last of which offices he was occupying at the time of his death. His most important work for the society and perhaps for the state, aside from the large general influence a man of such strong character always exerts, the volume of which cannot be measured, was done in connection with the New Orleans Exposition, held in the winter of 1884-5. Mr. Gould filled the position of superintendent of the horticultural exhibit from this state on that occasion, and the comparatively large numbers of awards made to Minnesota fruit there, when the opportunities are considered, attest the fidelity of his service. His report in connection therewith is on page 317, report of this society for 1885, and will be found interesting reading for those who take pride in the achievements of our state.

An excellent portrait of Mr. Gould, taken at that time, when he was at his best physically, was published last year as a frontispiece to the September number and is to be found in the bound volume of our report for 1895 opposite page 301.

Freeman G. Gould was a native of the state of Maine, town of Embden, where he was born on the 27th day of July, 1833. He passed the first twenty-two years of his life on a farm in that locality, coming to Minnesota in 1855. In the year 1858, he built himself a house in Mannanah, Meeker County, at that time the frontier of settlement, and the same year married Mary S. Caswell, who as his widow survives him, and who as an active worker in connection with our society is well known to all the older members.

At the outbreak of hostilities by the Indians in 1862, Mr. Gould became at once engaged as a volunteer in fighting them. A little later he became a regularly enlisted soldier in Company D, Second Minnesota Cavalry, holding the position of sergeant. He continued with this organization till the regiment was mustered out in December, 2d, 1865, its service being altogether in this state or on the plains west protecting the frontier from the Indians.

In 1866, Mr. Gould established his house in Excelsior, where he re-resided thereafter continuously up to the time of his decease. He embarked at once in the nursery business in which he continued till a few years since he constructed the Excelsior Greenhouses, to the care of which he devoted his time largely the last few years of his life. Mr. Gould held many offices of trust in the village where he resided and had and deserved the confidence of all who knew him.

In his death our society loses a staunch and true supporter. A man of strong character, pure principles and practice and of profound convictions, reinforced by excellent judgment and a native ability to impress his views upon others, his influence was large and far reaching. While his outward form is laid away, his influence and the memory of him remain a precious legacy most enduring in the hearts and lives of those he leaves behind. Loyal to his friends, always faithful and true and kind hearted to all, we may well recall and cherish his many manly and rugged virtues.—Sec'y.

A POEM.

MRS. S. IRWIN, EXCELSIOR.

Read at the Annual Meeting of the Minnesota State Horticultural Society,
December 5th, 1895.

VINECROFT, May 17, 1895.

It is hard to be a farmer when possessed of bookish taste
And feel that either mind or farm is sure to run to waste;
My soul cries out for knowledge with a greed I dare not utter,
Since 'tis the farm and not the books that brings the bread and butter.

I know 'tis oft-times hinted by the folks who do not know,
That fruiters lie in hammocked shade and watch the berries grow,
Then whistle for the hired help to load them in a van,
Drive to the nearest market and sell them—if they can.

To us who learned our lesson, such talk bespeaks "poor sense,"
For the price of fruit, like "the price of peace," is eternal vigilance,
Since every drowsy, stupid bug, each insect in the air,
Each crawling worm, each flying bird, expects an ample share.

The breezes through the orchard come heavy laden with news,
Which daily mails re-echo, but to read I must refuse;
For in looking through the orchard, I descry beneath the leaves
The densely peopled cities that the caterpillar weaves.

The birds upon the branches, pouring forth a flood of song,
Will soon be ravaging the grapes, "a hundred thousand strong;"
Then we must reconnoiter, tired, hungry, cold or hot,
And wage a fierce, vindictive war, with powder, caps and shot.

And then, besides these battles, there's a thousand things to do,
Like making fence and burning brush and berries to renew,
Garden to plant and trees to prune, raising each buried vine,
Planting the posts and stretching wires and tying up with twine;

Plowing and leveling the ground between the endless rows,
Where up and down, the summer long, the cultivator goes;
And when the vines begin to climb, then we begin to hustle—
You'd not believe how fast they grow, they make big stories rustle.

Over and over, up and down, forever pruning, tying,
Some one must go with railroad speed or cycle record vying,
Spraying with new insecticides, then lest the crop be lost
We range old stumps about in heaps to "smudge" in case of frost.

To hoe, to weed, to spade, to mulch are things that come of course,
And then there is the housework and the care of cow and horse,
The little ones to work for, love, school, sew for and to feed—
But without these small incentives, life would be blank indeed.

We find no rest on rainy days, awaiting adverse weather,
Thousands of baskets, snugly stored must then be put together;
Full eighteen hours of steady work, before at close of day
I lay me down too tired to read, almost too tired to pray.

Until, if safely guided on, through bugs, birds, fungus, frost,
We pack and send to market, then reckon up the cost;
And if above the wear and tear, encouragement we win,
We work awhile at something else and then again begin.

* * * * *

I am thinking of your topics as I go about my work,
But if I sit me down to write I'm brought up with a jerk
And find no time to "Fancy" since "Duty" stern and strong,
"Marches" me without "Music" in "Silence" right along.

Though oft at work till "Midnight," my pen lies idly by,
 'Tis o'er the endless "Must be done's" the fleeting moments fly;
 And from "Merry May" till "Easter" I can with safety say,
 No busier women can be found in all "America."

P. S.—

In looking o'er my letter I see that you may find
 An undercurrent of complaint,—I meant nothing of the kind;
 Indeed, I would not now exchange my rural situation
 For any phase of city life, no matter what the station.

Society we call the best—I know it well of yore—
 Contains a class of "borers" far worse than "currant bore;"
 You cannot clip them off with shears and burn as we do ours,
 You have to let them hang about and sap your mental powers.

It has its swarms of useless "moths" worse than our "cabbage flies"—
 You cannot send them on their way with pepper in their eyes;
 It has a host of parasites, the worst you'll ever find,
 You cannot dose with Paris Green or something of the kind.

It has its Black Rot, Blight and Curl—its Mildew is in sight—
 We use fresh lime and vitriol to set these matters right;
 It has its hail storms, drought and frost, which prey upon the heart,
 These latter come to every life, they are of life a part.

But in this busy, quiet place, whatever ills may come,
 Their blackening shadows do not spread far from my humble home;
 And so my forced seclusion from April to December,
 Affects or injures no one else except your country member.

REPORT ON SMALL FRUITS.

M. CUTLER, PRINCETON, MINN.

Owing to my short residence in this part of Minnesota, I have little to report on the subject assigned to me by your committee. Nearly all the old settlers of this county were lumbermen from Maine and paid little attention to the cultivation of the soil. Of those who have more recently settled here, the majority have given their attention to the cultivation of potatoes, onions and other vegetables, with great success, as demonstrated by our wonderful exhibit at the recent state fair. But little attention has been given to the cultivation of small fruits yet, but as nearly all kinds are found growing in abundance in a wild state, I have no doubt the time will soon come when northeastern Minnesota will be as famous for big berries as it is now for big potatoes and onions.

I have observed one thing here, and that is this, that few wild raspberries, gooseberries or high bush blackberries are found growing on the sandy land, but on clay land slashings where once grew the stately oak, maple, basswood, etc. Blueberries and dewberries are growing in abundance on the poor sandy land where flourish the jack pine and oak. Following nature's indications, I selected mixed land and now have a fine half acre of strawberries and a few blackberry and raspberry bushes, and should the coming season be favorable I hope to give you a good report one year from now.

We have a few beekeepers here. A Mr. Gerth, got 6,000 pounds of honey the past season, and has over 200 colonies. I should like to be with you, but had too many seven cent potatoes and too few ten cent berries to afford it. I hope and trust you may have a very profitable meeting.

PROFITS OF COMMERCIAL GRAPE GROWING.

"Every acre of good bearing vineyard," said one of our largest and most successful Western New York growers, "you can put down as costing \$300." Let us see:

In the wide range of the grape belt, the first cost of the land varies all the way from \$25 to, in rare cases, as high as \$200 per acre. For our theoretical vineyard, we will put the land at \$100 per acre. In a full discussion in the horticultural society on the cost for roots, posts, wire and labor for a vineyard from planting to the second bearing year, the estimates were none higher than \$80 nor lower than \$60 per acre. Let us take the first named figure, and our bearing vineyard has cost us all told, \$180 per acre. Now, we will let out the vineyard to halves, each party furnishing half the baskets, and will call the yield 800 baskets per acre, bringing 12c per 9-pound basket.

This then is the way our balance sheet will appear:

	Dr.	Cr.
One acre vineyard		
400 baskets of grapes at 12c.....		\$48.00
Interest on cost, \$180 at 6 per cent.....	\$10.80	
400 baskets at \$20 per m.....	8.00	
Fertilizers.....	5.00	\$23.80
Balance, net profit per acre.....		\$24.20

If we put the yield at 1,000 baskets, which vineyards on \$100 per acre land ought to bear, the net profit will be \$10 more, or \$34.20. If instead of leasing out the vineyard, the owners carry it on, the account will be about as follows:

	Dr.	Cr.
One acre grapes		
800 baskets at 12c.....		\$96.00
Interest on investment.....	\$10.80	
Cost of pruning, tying and cultivation.....	10.00	
Fertilizers.....	5.00	
800 baskets.....	16.00	
Picking, packing and hauling to station 800 baskets		
grapes at 2½ c.....	20.00	
Taxes.....	2.50	\$64.30
Balance, net profit per acre.....		\$31.70

A yield of 1,000 baskets would add \$15 to this, making the net profit \$46.70 per acre.—Fruit.

To the above expense account the Minnesota vine growers must add the expense of burying and a slight increased cost of baskets, which is more than offset however by the saving in cost of transportation and the increase of price for fresh home grown fruit. Grape growing can be made fairly remunerative on any location in our state that is reasonably frost proof, as the high lands south and east of our larger lakes. Sec'y.

It has recently been demonstrated for the first time, and that by Cornell Experiment Station, that the production of apples is far more exhaustive to the soil than wheat growing.

VENTILATION OF SMALL FRUITS WHILE IN TRANSIT.

The question considered below, on which the two writers apparently disagree, is of very great importance to the small fruit grower. It is copied entire from the "Western Gardener." Which is right, or are both so? Sec'y.

In the Fruit Grower's Journal of April 1st, we find the following article pertaining to ventilation of strawberries while in transit, to which we take some exceptions. The article reads as follows:

"It is pretty well understood among growers that strawberries do not need ventilation while in transit. If a case of berries is left at home uncovered for one night and is examined, it will be found that the berries in the lower tier of boxes have retained their color better than those in the upper tier. The latter will have turned dark, while those in the lower tier will have retained their brightness. The examination may be carried further, and if a box in the upper tier is emptied out, those in the bottom will be brighter than those on top. All of this goes to show that the more nearly air is excluded, the better the appearance the berries will present when opened in market."

After several years experience in fruit growing and shipping small fruits, we have made the following observations:

That strawberries, or any other small fruits that were kept over night on the farm, should be given as much ventilation as possible to have them go through in first class condition. When we first engaged in the business we filled our crates full, and, if the weather was extremely warm or damp, on the following morning we would find that the berries in the lower boxes had begun to mold, while those in the upper boxes were free from any indications of such loss. This led us to look into the boxes and learn if we could not provide a remedy. We then only placed our crates with one layer of boxes instead of both, leaving them so that the air could circulate freely, left them either in an open shed or in open air, covered with canvass to prevent rain or dew from falling on the fruit. After handling them in this way we had no complaints from our customers, and always found our fruit in good shape when we made shipments. It is true that this takes extra time and work, but when one takes into consideration the fact that his future trade will be largely augmented by giving his customers their fruit in the very best condition, he can well afford to give the extra time necessary for this work. If the grower has cold storage to place his fruit in as soon as crated and can ship in refrigerator cars, this airing process is unnecessary, but we can assure our readers that berries handled thus will stand further shipment than where placed in crates and nailed up closely as soon as picked.

Since we have proved to our own satisfaction that ventilation is a necessity before they have been shipped, we are of the opinion that ventilation while in transit would be desirable.

PEACH GROWING IN MINNESOTA.**M. PEARCE, CHOWEN.**

From our own experience and that of others, we know that excellent peaches can be grown in Minnesota—we have done it with little labor. It is the general opinion that peach trees are tender and will not stand much cold. Such is not the case, at least in Minnesota with our dry atmosphere. Peter M. Gideon, of Excelsior, the veteran peach grower, informs me that there was scarcely a winter with the light covering he gave his peach trees but they were exposed to 35 or 40 degrees of cold below zero.

Mr. Modlin, a very successful grower of peaches, said there was not a day in winter that the cats did not go under his peach trees.

A sandy loam sloping to the south is the best for peach trees.

Covering too early and too deep are two of the principal causes of failures. Remember this, make a note of it. Plant June budded trees.

Our mode of handling peach trees is as follows: In planting them out, place a board ten inches wide and a foot long on each side of the roots and make them grow two ways. Aside, from the top or feeding roots they send down two or three tap roots.

The last of October lay them down. Remove one board and dig down till you come to the tap roots; then press the tree down carefully flat onto the ground. Fill the hole with moist and fine soil and press it down, making a mound a few inches high; also cover the body of the trees with earth. Place a weight on each tree to keep it down. Let them remain in this condition till the ground is frozen, and the weight can then be removed.

Just before real winter sets in, along towards Christmas, cover eight or ten inches deep with long marsh hay.

Uncover the trees the last of March or the first of April, and let the trees remain two or three weeks before they are straightened up.

We are growing early, medium and late kinds; they all ripened and were good. One variety which ripened the ninth of August was large and extra good; of this variety we intend, if life and health permit, to propagate extensively.

By using careful thought on proper soil, peaches can be had from the ninth of August till the first of October fresh from the trees.

The Michigan agricultural college will send a collection of flower seeds to the first ten school districts in each county that shall make application for them. This effort to create a love for flowers and a regard for the appearance of the school yard is commendable and will be an important factor in a child's education.

My favorite plan for planting an orchard is to plant trees close in the row, with rows five to ten rods apart, intending thus to cover every field in the farm. This gives ample feeding space for the roots and ample access for air and sunshine. By this method each field can be planted to small fruits or farm crops without difficulty of getting about the trees with plow and cultivator.—C. A. Green.

THE CROSBY PEACH.**THE CROSBY PEACH.—ONE-QUARTER SIZE.**

This is described as "*The great peach of the North. Has not failed to produce a crop in twelve years. Hardest of all peaches. A beautiful yellow freestone peach, with very small pit. Excellent flavor. Tree rather dwarf. It comes nearer being frost proof than any other.*" Hon. J. H. Hale, before the Western New York Horticultural Society, January 24, 1894, stated that it had not failed to fruit in eleven years and that nearly every bud had come through the winter unimpaired.

If you are going to plant peaches this may be worth trying.—Secy.

EAT APPLES AND BE HEALTHY.—According to Dr. G. R. Searles, the apple is medicinal in a marked degree. He says: "The apple is such common fruit that very few people are familiar with its remarkable efficacious medicinal properties. Everybody ought to know that the very best thing they can do is to eat apples just before retiring for the night. Persons uninitiated in the mysteries of the fruit are liable to throw up their hands in horror at the visions of dyspepsia which such a suggestion may summon up, but no harm can come to even a delicate system by eating ripe and juicy apples just before going to bed. The apple is an excellent brain food, because it has more phosphoric acid in easily digestible shape than any other vegetable known. It excites the action of the liver, promotes sound and healthy sleep and thoroughly disinfects the mouth. This is not all. The apple agglutinates the surplus acids of the stomach, helps the kidney secretions and prevents calculous growths, while it obviates indigestion and is one of the best preventives known of diseases of the throat. Everybody should be familiar with such knowledge. In addition, next to the orange and the lemon, it is the best antidote for the thirst and craving of a person addicted to the alcohol or the opium habit.

GRAPES BY THE KNIFFIN SYSTEM.

As most vine growers are aware, this system consists in training the vine upon and along the top wire of the trellis instead of along the bottom wire, permitting the fruit and growing canes to hang down instead of tying them upright, as by the old plan. This method is meeting with great favor.—Secretary.

Assuming that most of you are growing grapes upon the four arm system, let me say that we have changed our system so that we use only the two upper arms, and grow all our grapes upon these arms. Why have we changed, and what has been the result? We observed that a much larger proportion of marketable grapes grew upon the upper arms, and as it was marketable grapes that we wanted we removed the lower arms. Now, in order to get the quantity necessary we leave upon this single cane which constitutes the arm upon each side of the main vine a greater number of buds, which distributes the new growth over more surface, preventing the overcrowding of the fruit upon the vine. We leave upon the two arms twelve to fourteen buds each.

The summer pruning consists in removing after the fruit is set the clingers and seconds and afterward the laterals, and clipping off the fruit bearing shoots at the third or fourth leaf beyond the fruit, excepting one good shoot nearest the head of the vine which is left for the fruit bearing cane for the next year. We also remove the poor clusters and never leave more than three clusters, usually but two, and sometimes only one upon a shoot. There will then remain upon the vine from thirty-five to forty clusters, and I think it will pay to remove still more, not leaving over thirty clusters on the vine, for if we can grow thirty clusters to weigh twenty pounds, I believe they will sell for more money than forty clusters weighing twenty-five pounds and less expense in marketing.

I am after quality in preference to quantity. What are the indications of high quality and where do we find it? Like the peach, the rich bloom upon its surface is indicative of its quality, and you find this bloom most perfectly developed upon the largest and finest clusters upon the vine. By the method of pruning which I have indicated, all clusters hang in their natural positions upon the vine independent of each other, are more compact in their structure and better developed in their growth. There are other advantages that aid in perfecting the fruit. These are the free circulation of the air under the vines and fruit, the clean surface of the ground affording no lodgment for sporadic or fungous growth, also the ease with which the vines may be sprayed, the rapidity with which the fruit may be gathered and the ease and rapidity of the winter pruning.—Fruit.

Apple trees should be sprayed from a platform elevated six or eight feet above the wagon. The object is to throw the spray down on, rather than up under the foliage.

FRUIT BLOSSOMS, REPORT FOR 1895.

L. R. MOYER, MONTEVIDEO.

At Montevideo we had an early spring. The mercury showed a temperature of 73° on April 3d, 74° on April 4th and 76° on April 5th. On April 20th, the thermometer showed 80°. The next morning the thermometer showed 1° below freezing point and the morning after 3° below.

Buffalo berries were in full bloom on the 17th, and the amelanchiers soon afterward. The buffalo berries proved to be all staminate. There being no pistillate trees to receive the fertilizing pollen, we are unable to say whether the frost injured them or not. The Juneberry blossoms were uninjured, so we conclude that they are frost proof.

The next day after this severe freeze, the mercury had risen to 83° again, and plums and sand cherries began to bloom. On April 30th, the mercury was at 83° again, and some bloom began to show on the apple trees. The warm weather continued uninterruptedly until the morning of May 11th, when the mercury again touched 32°. The two following mornings, the thermometer showed 31°, and the frost was very severe.

On May 20th the mercury fell to 30°, and the resulting frost swept away all the gardens and most of the fruit. Never before in the history of western Minnesota was the display of fruit blossoms more gorgeous and promising. But the flowers came too early, and the frost came too late. There was very little fruit.

NEW CURRANTS AND OLD.—For nearly fifteen years the New York Experiment Station at Geneva has made a specialty of testing currants and now has growing thirty-seven cultivated varieties and three wild kinds, exclusive of station seedlings. Bulletin 95 describes these and also discusses their comparative value as shown by the average yield of the varieties in full bearing during the past three years. Prince Albert, a red currant, was the most productive of all the kinds tested, having an average yield for three years of 9 pounds per bush, London Red, Victoria, Cherry and Fay following in the order named. For jam, Cherry is preferred, but for jelly, Fay and Prince Albert. White Dutch was the most productive white variety, averaging 6 pounds per bush, and Prince of Wales the best bearer of the black kinds, averaging 5½ pounds. Individual varieties in the different classes vary much in productiveness, but the most productive black currants do not equal in yield the most productive red or white kinds. It is estimated that on account of their being less productive, one would need to realize 1½ to 2 cents more per pound for the black as a class than for the red or white currants. The bulletin also describes the propagation and culture of the currant. Bone meal and muriate of potash seems to make the best fertilizer for the currant bush, with a little nitrogen.

THE COMMISSION MERCHANTS.

(Discussion at the Annual Meeting, December 7, 1895.)

MR. CORBETT: *Ladies and gentlemen:* It was not with the idea of coming down here to make any talk, or to attempt anything in the way of speech making that I suggested to your president yesterday the idea of meeting with you this morning. I thought it would be well for the fruit handling commission men of the city to meet with you in your session, rather in a friendly or social way to exchange, perhaps, a few personal ideas in regard to our mutual interest. Not anticipating that I would be called upon to make any remarks, what I shall say will be entirely on the spur of the moment. I feel this, that the commission men and fruit dealers of the city have the widest and fullest interest in the success of horticulture in the state, and having that interest at heart we certainly feel like expressing it and feel like coming before you and exchanging some ideas with you in regard to the matter. I have attended conventions two thousand miles away from here of the great fruit growers of the country, and I certainly thought and felt that here in Minnesota, in our own home, we could not manifest our appreciation better than by at least asking to come down to see you. We were glad of the opportunity, we were pleased to come here, and I can say for myself that I was not only pleased, but I was surprised to see the exhibit you made, and I am glad that an opportunity has presented itself that we may see what is being done in regard to the fruit industry in Minnesota. The display of apples and the display of other fruits is certainly remarkable. It is remarkable to me, who has been in the business and am in the business, that in Minnesota we are doing as much as you people have developed here.

I attended a fruit growers' convention in Spokane, where three states were represented, and in addressing the convention I attempted to show the close intimacy existing between us and them, they as the coming fruit growers of the country and we as a large people here, non-fruit producers but large consumers. I am glad to say I have occasion to change my mind in regard to that matter. I can now say we have become fruit producers.

There are some things that I would like to suggest to some of you gentlemen as shippers, and that is in the line of a little better preparation of your fruit. Your apples that I have seen here on our market have not been put up in the best way. They have not been put up in the best way to bring the best returns to you. They have not been satisfactory to us who handle them, because when we do not get good results it is just as unsatisfactory to us as it is to you. The Duchess has been marketed in large quantities during the past season. They came to us in sugar barrels, gunny sacks, cracker boxes, shoe boxes, poultry crates and in every other way except the right way, and the result was they did not bring the prices the Wisconsin fruit brought or that the Illinois fruit brought, and it seemed to you as if the commission man here was not doing his duty.

In regard to crab apples, it is my idea that a little greater concentration on the production of the crab would be best as far as growing a nice apple, a standard apple from the middleman's standpoint is concerned, and you could not grow too many. That is the apple

you ought to grow in this state for the market. Thus, last year and this year the demand for crab apples was far in excess of the supply. I know that we had orders for a thousand barrels or more that we could not supply. One other thought I wish to express in regard to marketing the crab apple; the crab apple will bear packing and careful handling. The barrels should be filled and packed so the apples will not roll about. Then, also, care should be taken in picking the fruit. Apples come to us which appear to have been clubbed off with a rail or a flail. They are not salable in that shape. So far as small fruits are concerned, I think it is beyond question that the small fruits of this state rank as high as any small fruits grown in the union. In regard to some other things, I was somewhat interested when in visiting Chicago some time ago I saw some fine cucumbers offered for sale. I asked a friend of mine I was with where they came from. He said they came from Minneapolis. It was quite a surprise to me to think that Illinois should depend to a large extent upon the state of Minnesota for her supply of winter tomatoes and cucumbers. I think these other gentlemen here can say more to you than I can. It is a matter in which we are all interested and glad to co-operate with you.

Pres. Underwood: We appreciate the interest you are taking in our work, and we should be glad to have you gentlemen, without any formality whatever, participate in our deliberations on all points of interest. We would be glad to hear from Mr. Stacy, one of the leading commission men of Minneapolis.

Mr. Stacy: I do not know that I can add anything particularly to what Mr. Corbett has said, and I will not take up any of your time.

Pres. Underwood: We would like to hear from Mr. Palmer, of Porter Bros.

Mr. Palmer: Mr. President, and gentlemen, speaking is a little out of my line, and I only can endorse the remarks made by Mr. Corbett. The great trouble with apples is that they are brought to our market in improper shape. What we want principally is crab apples. The demand in North Dakota for crab apples is enormous, and they always look this way for their supply, and if we can give them nice, sound crab apples, in nice, clean packages we can always get a good price for them, and this is what I want to emphasize to you, to raise all the crab apples you can and send them to the market in good condition.

Mr. Elliot: What variety of crabs do you consider the best shipper?

Mr. Palmer: Hyslop.

Mr. Elliot: What is the next best variety?

Mr. Palmer: The Transcendent, but as a rule it comes into the market too ripe for shipment. Of course, it is all right for the local market.

Mr. Bunnell: How does the Hyslop compare in price with the other varieties?

Mr. Palmer: It always brings more.

Mr. Philips (Wisconsin): How is the Whitney No. 20?

Mr. Corbett: Well, we are not familiar with the names of varieties.

Mrs. Kennedy: I was taken quite severely to task yesterday by some of our good people for saying that some people were so ignorant, and now it appears that some of you fruit men are so ignorant that you take a rail to knock off your apples with. (Laughter). Mr. Corbett, I am very much obliged to you for that information.

Mr. Harris: Ordinarily the fruit men who send their fruit in that style do not belong to the State Horticultural Society. I live in Houston county. I have seen thousands of bushels of crabs lying under the trees breeding worms, because at La Crosse they could not get more than fifteen cents a bushel for them. One La Crosse merchant told me he had often bought them and sent them up here to this market and cleared one dollar a bushel on them. I believe what we have heard here will do us more good than what this meeting will cost us. This past year I sold my crab apples for twenty-five to fifty cents a bushel. For very fine fruit, I got fifty cents a bushel. I left orders at home to dispose of all they could at home, and I lost \$150.00 by not sending them to this market. I would like to ask the gentlemen here if it would pay to pack such tender varieties as the Transcendent in small packages? I see farmers who have perhaps one hundred bushels. The farmer loads his wagon box full of apples, and then he fills a lot of sacks with apples and puts them on top of the boxful, and then on top of all he piles his wife and children and the hired man, hitches his team to the wagon, and those apples are bumped up hill and down hill, and then they are sold to the local merchant and barreled up and sent to Minneapolis. I told one of those men it would pay him to buy bushel baskets.

Mr. Corbett: Our firm alone had to cancel orders for over two hundred barrels of apples this fall.

Mr. Stacy: It is best to pack them in barrels; that is the uniform package.

Prof. Green: Does it pay to face the barrels, the fruit?

Mr. Corbett: That question answers itself. A pretty lady is never the worse looking for being nicely dressed. A barrel of apples should be put up nicely.

Mr. Philips (Wisconsin): Apples packed in new barrels bring the best prices. It pays to ship in new barrels. It is quite a considerable work to face out small crab apples.

Mr. Corbett: It will add twenty-five cents a barrel to the price. It will pay to face your apples for the time spent in doing it.

Dr. Frisselle: I do not know, but would it not be well to put them up in smaller packages, say in half barrels?

Mr. Corbett: The barrel is the standard we work from, and as far as price is concerned I do not think it makes any difference whatever.

Dr. Frisselle: It is somewhat difficult to press fruit of this sort. Does the color have anything to do with the price the apples bring?

Mr. Palmer: Well, the red apple sells for much more than the lighter color, and sells better. A red apple will outsell any other color.

Mr. Corbett: I do not know that there is so much difference. You get more uniformity with the red apple than with the yellow. There is but little difference to the trade. In North Dakota and Winnipeg the red crab is much more desirable. But in South Dakota there are thousands of people who want the yellow crab apple.

Mr. Wedge: Do you think another crab as good a shipper as the Hyslop and colored red would sell as well? I will say the Hyslop is hard to raise.

Mr. Corbett: I do not think it would make any difference what it was.

Mr. Kellogg (Wisconsin): You would sell it for the Hyslop anyway. (Laughter).

Mr. Corbett: Well, we always sell what the people want.

Pres. Underwood: In shipping some delicate apples like the Whitney, that are liable to bruise, I was going to ask if it would not be desirable to ship them in small packages.

Mr. Corbett: I do not think it would be from the peculiar situation of our market. It does not cut any figure with the trade. They do not want any special fruit simply because it is early or has some other good point about it. The people are willing to wait until later in the season when more is offered

and the prices are lower, so I don't think it would be any encouragement to offer it in that form.

Pres. Underwood: Is this sixteen quart package (exhibiting a crate) the package you like to have strawberries come in?

Mr. Corbett: Our wise legislature has been attempting to legislate in the interest of the consumer, but I think the twenty-four quart package gives us the most desirable crate to put strawberries in. It is a thing that must be apparent to you that it is just as easy to sell twenty-four quart cases as it is to sell sixteen quart cases, and it is all done in one transaction and is in every way more desirable.

Pres. Underwood: Is this the kind of quart, as shown in this crate, (exhibiting a sample) that you want strawberries in?

Mr. Corbett: I would rather have the full quart.

Pres. Underwood: Would they bring more in that size?

Mr. Corbett: I think they would. The consumer makes an objection because the box does not contain a full quart and is always willing to pay more for a full quart.

Pres. Underwood: I think this is a very important question to us. The Southern fruit shipped in is in quarts which have been adopted by Illinois and Wisconsin. Our quarts are called the short quart. It is the same size over the surface, but not quite so deep. If by using the full quart we can get so much more for our fruit, when we buy our supply of boxes next year we ought to get the full quarts.

Mr. Corbett: The Florida fruit comes in that shape, but while fruit at that time is scarce, people are pleased with the large boxes and they buy it.

Mr. Harrison (N. Dakota): So much has this short measure been practiced on us people of the North, that it is hard to tell whether we get a full barrel or a full quart. In regard to crabs, you can sell two barrels of crabs in North Dakota to one of any other kind.

Mr. Brackett: Are the people prejudiced as to the color of raspberries?

Mr. Palmer: The Cuthbert is the most desirable. The Turner is a good fruit; it is large, juicy and sells well.

Pres. Underwood: How about black raspberries?

Mr. Palmer: The Gregg is the best. The larger they are, the better they sell.

Mr. Wedge: How do our better grade of wild plums stand in the market?

Mr. Corbett: We have no experience as to the variety.

Mr. Elliot: While we are all interested in horticulture, there is one thing that almost every horticulturist produces, and that is potatoes. We would like to know the best package to ship potatoes in.

Mr. McLean: The most desirable package is sacks. They must be sacked somewhere, and it might as well be done where they are dug as anywhere else.

Mr. Elliot: The reason I asked the question, in going out into the country I saw farmers putting them in sacks.

Mr. Brackett: Is there a marked difference in the price of very early blackberries compared with those that come in later?

Mr. Palmer: The earlier berries bring considerably more than those that come in later.

A MODEL FORESTRY COMMISSION.

By the official initiative of the Secretary of the Interior, the Honorable Hoke Smith, a national investigation has just been set on foot, which, by the sheer force of its authoritativeness, must compel legislative attention. By the constitution of the National Academy of Science, it becomes the duty of this body to undertake the investigation of any scientific problem upon the request of the head of a department of the government, and such a request for the study of the subject of forestry Secretary Smith has made of the president of the academy, Professor Wolcott Gibbs, who has responded in a spirit commensurate with the importance of the secretary's wise and patriotic action. In his acceptance of the task President Gibbs says:

It is needless to remind you that the matter you refer to the Academy is important and difficult. No subject upon which the Academy has been asked before by the government for advice compares with it in scope, and it is the opinion of thoughtful men that no other economic problem confronting the government of the United States equals in importance that offered by the present condition and future fate of the forests of western North America.

The forests in the public domain extend through 18 degrees of longitude and 20 degrees of latitude; they vary in density, composition and silvicultural condition from the most prolific in the world, outside the tropics, to the most meager. In some parts of the country they are valuable as sources of timber supply which can be made permanent; in others, while producing no timber of importance, they are not less valuable for their influence upon the supply of water available for the inhabitants of regions dependent on irrigation for their means of subsistence. The character of the topography and the climate of most of the region now embraced in the public domain increase the difficulty of the problem. Scanty and unequally distributed rainfall checks the growth of forests, while high mountain ranges make them essential to regulate the flow of mountain streams.

You have done the Academy the honor of asking it to recommend a plan for the general treatment of the forest covered portions of the public domain. That its report may be valuable as a basis for future legislation, it must consider:

1. The question of the ultimate ownership of the forests now belonging to the government; that is, what portions of the forest on the public domain shall be allowed to pass, either in part or entirely, from government control into private hands.

2. How shall the government forests be administered so that the inhabitants of adjacent regions may draw their necessary forest supplies from them without affecting their permanency.

3. What provision is possible and necessary to secure for the government a continuous, intelligent and honest management of the forests of the public domain, including those in the reservations already made or which may be made in the future.

This admirable statement of the scope of the work is accompanied by the appointment of a commission of experts to undertake the investigation, which in character and in range of scientific knowledge of the sort that qualifies for a given task, has seldom, if ever, been equalled in the record of governmental work. The members are: Professor Charles S. Sargent, of Harvard, chairman; Professor Wolcott Gibbs, ex-officio; Alexander Agassiz; Professor W. H. Brewer, of Yale; General Henry L. Abbott, U. S. A. (retired); Arnold Hague, of the Geological Survey and Gifford Pinchot, practical forester.

These gentlemen, serving without pay, will proceed to make a scientific and practical study of the public forests from every point of view and on the ground, and their report and their recommendations, whatever they may be in detail, cannot fail to carry such weight with the press and the public that it will be as impossible to go back to the old policy of neglect as to re-enact literary piracy or the toleration of lotteries or any other outworn system of robbing the many for the benefit of the few.

We regard the establishment of this commission as a landmark of national progress. While of extraordinary value to the whole country, it will prove, particularly, the salvation of the West from those who would sacrifice its entire future to the greed of the immediate moment.—*The Century Magazine, May, 1895.*

PETUNIAS.—I once knew an old bachelor who lived in a house by himself on a Western prairie. A stray flower catalogue fell into his hands, and in it he found a colored picture of that brilliant carmine petunia, Countess of Elsmere, so much used for bedding. It struck his fancy, and he sent for three papers of the seed. Next he made a big, round flower bed, at least ten feet in diameter, and sowed the entire bed to the petunia seed. The ground was mellow, the soil was rich, and the little seedlings soon grew into long armed, thickly matted plants. When they bloomed, the purplish hue of the flowers could be seen a mile away, and when face to face with the bed it was seen to be a solid circle of glowing, radiant, velvety bloom. As he complacently and slangily remarked: "His bed knocked the socks off from any other flowers on the prairie."

I give this as an example of what a striking effect can be obtained at little cost or trouble by the use of this good old annual, of which it may truthfully be said that it is one of the half dozen best plants in existence for garden decoration.—Vicks.

PLUMS AND CHERRIES.

L. J. GJEMSE, HADER.

Last year I became one of the members of your society, and at the last annual meeting, held at Lake City, was appointed on the committee on "Plums and Cherries." I have tried during the spring and summer to be on the lookout for facts relating to these two subjects, but have been only partially successful for three reasons, viz: first, my experience in horticulture; second, the unfavorable state of the weather during the spring; third, the scarcity of named varieties cultivated in my neighborhood. I ask, therefore, the society to deal leniently with me and my somewhat meager report.

This spring (1895) was an early one and flowers began to appear on the plum trees during the last week in April, and they continued blossoming through the first three weeks in May. May 4th a hailstorm passed over here, lasting about twenty minutes, and a whole lot of the flowers were knocked off, but not so many as to seriously injure the prospects of a fair crop.

Between the 10th and the 14th, a spell of cold weather set in, and the ground froze, and ice formed on the water during the nights. Only a few flowers escaped injury, and the fruit from these was small and most of it injured by the curculio. On June 23d another hailstorm passed over parts of this county and destroyed what had been spared by the frost.

There are three or four farmers not far from here that raised a fair crop of apples and a few plums. They were fortunate enough to escape the hail, and their orchards were protected on the north and west sides by thickets, which shielded them from the cold wind and saved them from injury by the frost.

Out in the woods where the hail did not hurt, the choke-cherry, pin-cherry and black-cherry bore a lot of fruit. Even where the trees stood exposed, some fruit was found. This was, no doubt, owing to the fact that the cherry trees put forth their blossoms after the cold spell in May was over.

Of named varieties found here, I have nothing to say, as none bore fruit.

The foliage was not much injured, and fewer insects were found on the trees this year than last.

If I should make any suggestions, which would be rather preposterous in one so inexperienced, I would say:

1. Protect your orchards well on the north and west sides by planting a substantial windbreak.

2. In the spring have straw and refuse piled up at different places in your orchard ready to be set on fire when you fear a cold night. The heat and smoke wafted between the trees may save your fruit crop and well repay the trouble taken.

REPORT ON FORESTRY.

J. O. BARRETT, BROWN'S VALLEY.

(Read at the Annual Meeting of the State Horticultural Society Dec. 4th, 1895.)

I recall the fact that about ten years ago this society was struggling for the position it deserved. The old veterans, who had fought the demons of doubt and indifference as to raising fruit in Minnesota, stood their ground, brave as the little band of Greeks fighting the Persian hosts at the Pass of Thermopylae. They pounded their way forward, gaining public confidence slowly but surely, and their victory is so historic, that the Minnesota State Horticultural Society is recognized as one of the most talented and efficient in the United States. As proof of this fact, we have but to survey the vast fruit areas all around us.

And I recall another noteworthy event, that the horticultural society never ignored the claims of forestry. In the darkest hour of the Forestry Association—do you not remember it?—this society took it under its fostering care, keeping the spark of life in the sick baby. At an annual meeting six years ago in this city, Wyman Elliot being president, the question, whether the association should cease to be by merging it into this society, was entrusted to a special committee, consisting of Chas. Luedloff, C. L. Swift and the writer of this, who, after canvassing the situation, reported that the association was not ready to die but must live to see a brighter day. Soon after this, a few veterans of the association met in the Historical Rooms at St. Paul and further discussed the matter and concluded to go ahead. Having elected a new board of officers, the association struck out, breasting the storm of human wrath, as did the horticultural society in the long ago. But few know what battles we have had to fight, but not a man among us flinched from duty. You know the result. Today our association is regarded by foresters as one of the most persistent and effectual in the Union of States. That the public pulse has been stirred to beat in favor of forestry is evidenced by the newly awakened interest in tree planting on the open prairie, by a legislative reckoning with the timber thieves and by the organization under state authority of a forest fire warden system with earnest men to operate its machinery. The year of our Lord, 1895, inaugurated practical forestry on its essential lines. The initial step taken sooner than we anticipated, the evolutionary work is before us. Following the success of organizing a system of protection to forest property and life against fires, in the bill in which our association had a conspicuous hand, the legislature again appropriated means to support our arduous labors.

Since the new departure of 1889, under the auspices of this society we have certainly sent to the people not less than 700,000 pamphlets and circulars, also plants and seeds by thousands upon thousands, and the call for them increases on our hands.

We are now making vigorous efforts to establish a forestry library for our association; for books we have to depend upon donations,

which thus far are promising. Of course this is a hint for you to keep in mind, and our association will be grateful for any favors of the kind.

The date of holding the annual meetings of this society being changed, it necessarily divorces the joint sessions heretofore so harmoniously obtaining. Speaking, as I know I do, for the association, this divorcement shall not separate our mutual work in a common cause; our hands shall hold closer your hands, if that can be, and our hearts beat together in oneness of fellowship. We of the association propose to attend your meetings, working with you, and can reasonably anticipate that you will reciprocate this courtesy by meeting with us, working together again for forestry in its interchangeable relation with horticulture.

The new departure of forestry involves greater responsibilities than the past. We must build upon what has been gained by earnest endeavor and self-sacrifice. We discover now that what seemed losses and mistakes, were victories of mental experience to profit by. The better educative work is begun, the more practical follows.

Our association has recently issued a modest little pamphlet, entitled "Forestry in our Schools." It has been widely distributed throughout the state and is most cordially received. Its design is to help instructors in awakening and directing the youth in love and care for trees. Its educational methods are simply suggestive and hopefully pleading for the hearty co-operation of the schools. Of course such discipline is too diffusive and rudimental to meet the full necessities of the situation.

Noting the rapid growth of our experiment station and its divisions in public favor and patronage, any one can foresee that it is destined to be to the state what a governmental forestry school is to Germany or France and far better adapted to our needs than a monarchical system of forestry.

Let us then understand the duty assigned us and consider the fact that we have but just begun it. The forestry movement in Minnesota has gestated enough to show that it has two ruddy arms to its stalwart body, raising trees and saving trees. They must not be allowed to antagonize each other, but we trust both will antagonize the policy, growing in favor, that if fires are kept out of our forests they will develop all that is needful. Keeping out the fires is a great achievement, but to stop right there is about as credible as it would be for the horticulturist to plant an orchard and let it take care of itself, bound in wild grasses and devoured by rabbits and insects. The treatment necessary to lasting success with our planted trees is equally applicable to our native trees. There is no substantial hope for practical forestry unless we do keep out the fires, but we must also keep out browsing stock, cut only for forest improvement, thin out for hardy and profitable growth, exterminate preying rodents and insects, preserve continuity of shade for water economy, and thus perpetuate the lumber industry and the healthfulness and beauty of the state.

GOOD STORAGE FOR THE ORCHARDIST.

(Extract from a paper read by J. M. Purdy, before the Missouri Horticultural Society, at Neosho, in Dec., '95.)

It is not necessary to go to any extravagant expense, and, besides it is not needed. Select a gravelly hillside. Excavate to the required size and depth, and then wall it up with stone picked off your fields. Then roof it over. A double roof is best, built in the following manner: Lay a plate on the wall and put on rafters and sheathing as for a roof. Cover sheathing with building paper. Over this lay a second course of rafters with sheathing as before. Fill in between the two courses of sheathing with sawdust. Then put on the shingles. Before shingling a good ventilator should be put in, running up through the roof. Then with double doors to your cellar you are prepared to hold your apples. Care should be taken to see that the cellar is well drained and well ventilated. The main thing is to keep as near an even temperature as possible. In warm weather in the fall, after the apples are put in store, the ventilators should be opened at night and closed in the day time. All the work on a cellar like this can be done with the ordinary help on the farm. It does not require a skilled mechanic to excavate the cellar, to make the mortar or lay the wall. The roof and doors you can build as well. The work can be done at odd times during the summer, when you would not usually be otherwise engaged.

A good and satisfactory storage for your fruit or vegetables can be put up even cheaper than the one I have described, and it would pay for itself almost the first season. After excavating the cellar and building the wall as before, set up a row of posts along the center the long way of the cellar, high enough when a ridge pole is put on to support the upper ends of the rafters. Cover the rafters with rough boards as for roofing, and then cover with dirt, well packed down and thick enough to turn the water and keep out the frost. The timbers should be of good size, sufficient to sustain the weight of the roof.

A fruit house entirely above the ground can be put up at not a very large cost, in which an even temperature can be maintained and which will keep out the frost, as follows: Prepare a good tight foundation of stone for the building. Use 2x4-inch studding for the sides. The sides should be about eight feet high. Sheath on the outside of the studding with inch lumber and cover this with building paper and then on the outside of this with another course of studding, sheathing and building paper. Do this until the wall has three air spaces. The roof is constructed the same way to protect from heat as well as frost.

The writer has recently constructed a cellar and fruit house over it, as follows: The floor between the cellar and fruit room above is laid with 2x8 joists, ceiled above and below with inch boards and the space between it filled with sawdust. The studding for the sides are 2x6, eight feet high. Outside it is sheathed lengthwise with inch lumber, and on this a layer of building paper. Then comes a course of inch pine siding and battened. On the inside a layer of building paper is tacked to the studding and then a course of inch lumber.

The 6-inch space between the two courses of sheathing is filled with sawdust well packed. Building paper is tacked to the under side of the rafters, and an inch pine ceiling is put on, and the 4-inch space between the roof boards and ceiling is filled in with sawdust. It is ventilated with windows at each end.

The main points to be kept in view when planning a storage place for our apples are good drainage, good ventilation and security from heat and cold. Here in this climate we are very apt to have in the late fall and also during the winter months warm spells of weather and during these warm spells the ventilators should be opened at night after the atmosphere has become cool, and kept closed during the daytime. In this way nearly an even temperature can be maintained, not so low, perhaps, as in a costly cold storage plant, but sufficiently low to meet the requirements of the average fruit grower.

THE HOME MADE SPRAYING MACHINE shown in the accompanying cut is thus described in bulletin 113, Cornell University Agricultural Experiment Station.

"The greatest sensation of the day, however, was occasioned by the appearance of the home-made sprayer of Potter and Ware. An ordinary barrel spray pump was fastened to a barrel having a capacity of about fifty gallons. The liquid was pumped into a gas pipe which was supported upon a light frame at the rear of the wheels. This pipe was fitted with four discharges to which nozzles could be attached. Four rows were sprayed at once, the work being fairly well accomplished as the horse walked across the field. Mr. Ware drove and pumped at the same time, and the machine worked without a break. The plants were uniformly although rather lightly covered, and the machine was pronounced a decided success by the four or five hundred people who saw it in operation."

STRAWBERRY LEAF BLIGHT.

This is a fungous disease that affects the strawberry leaves and causes the brown spots or patches on them. It is also called strawberry rust by some. The disease does not generally appear until about fruiting time, when it appears as small, reddish spots, which increase rapidly in size, the center being of a lighter color. These spots often run together, forming large blotches; the affected leaves wither, turn brown and die. Some varieties are more affected by it than others, and this should be taken into consideration when selecting varieties for planting, as the disease seriously affects the vitality of the plant and diminishes the crop the next year.

STRAWBERRY LEAF BLIGHT.

Spraying with Bordeaux mixture is successfully practiced in preventing this disease. The first spraying can be given early in the spring after the new leaves start and just before the blossoms open; the second soon after the fruit is picked, followed by two or three applications about two or three weeks apart.—*Ark. Exp. Station.*



In the accompanying cut is shown a device for the single horse plow, showing the side block which enables the horse to keep the furrow, throwing the plow into the land. With a light, single plow, a steady horse and careful driver all the dirt can be turned over between the trees, without barking.

SMALL FRUITS.

JOHN EKLOF, COKATO.

In this section of the country, the fruit growers are few and far between. Apple growing has been almost abandoned, as the blighting kinds were largely planted and are now killed out, excepting those having a very favorable location. The farmers have now turned their attention more towards the growing of small fruits.

The past season was not a very favorable one. Owing to the late spring frosts, where the strawberries were uncovered early, they bore but half a crop. The Crescent heads the list for productiveness, hardiness and healthiness.

The Warfield is also a good bearer; for pollenizers the Wilson and Jessie are mainly planted. The Jessie is a rather weak grower and is not a good propagator, but it is fairly productive, the berries being large and of good quality.

I have on trial the Robinson, Captain Jack, Bederwood, Lovett, Haverland and Woolverton. All I know about them yet is that they seem to be vigorous growers, as they set a lot of plants, although the drought prevailed all summer.

Of raspberries I have found but one variety of the red that has gained my confidence, and that is the Philadelphia. For hardiness and productiveness it is unexcelled here. Last winter was a severe one for raspberries that were unprotected. My Philadelphias killed back about a foot, the Turners to within eighteen inches from the ground and, consequently, did not bear half a crop. The Cuthberts were a total failure; they have never been profitable here; to be paying they should bring double the price that raspberries are sold for.

In neglected plantations of raspberries of several varieties, the only ones surviving, I have found to be the Philadelphia. They will stand more adverse treatment than any other variety and still bear. It is a slow propagating variety, and the fruit is not of the highest quality, though for home consumption and a near market it equals any.

The blackcap varieties are not grown to any extent here. Mr. Fayette Lee, of this place, grows the Nemaha, which he says does better on his soil than the red varieties. The patch is a fine one to look at.

My experience with blackberries is not a long one. I have three-quarters of an acre of Ancient Briton, Snyder and Stone's Hardy. The location is a very sheltered one. Last winter they were left uncovered, and still they were not injured as much as the raspberries. Of the three varieties the Briton has done best so far; it has been equally hardy with the Snyder and a more certain cropper. The Snyders have produced little fruit; the berries dry up when about half grown, and there are few berries perfect when ripe. I wish some light would be given on this subject, what the cause is and how it can be prevented. If I have the true Stone's Hardy, it does not differ much from the Briton. The only difference I find is in the shape of the bush, Stone's Hardy being more spreading.

I agree with those claiming that blackberries do better in partial shade. On the south side of my plantation is a row of cottonwoods,

and the row of blackberries next to it bears larger and better developed fruit.

Currants and goosberries need scarcely be mentioned, as every body can raise them with equal success.

Of the later introduced varieties of currants, the Fay's Prolific does well in some years; the berries are twice the size of Cherry currants, and it is fairly productive. It is, however, not a reliable bearer.

The Houghton and Smith's Improved gooseberries are enormous yielders, but they are usually affected with mildew.

The frost of May 18th injured the currant and gooseberry crop to quite an extent in some sections, the berries being about half grown at the time. They look as if they had been singed by fire.

SIX ANNUALS FOR THE SUMMER GARDEN.—“The annuals undoubtedly produce a stronger effect of color in the garden than their longer lived relatives, the perennials and their biennials,” writes F. Schuyler Mathews: “What they do is done quickly, and with astonishingly prolific results. It is also a significant fact that these results are brought about in the most favorable season of the year for flowers—midsummer.

“When I choose six annuals—poppies, marigolds, nasturtiums, phlox Drummondii, sweet peas and asters, it must not be inferred that these are exceptionally beautiful; the choice really takes into account their prolific bearing qualities. Nearly all of the annuals are charmingly beautiful; but these six are not only so, their beauty is of a kind which seems inexhaustible. With proper treatment they keep on blooming and blooming until the attacks of frost have actually caused their death. Besides all this, the color tones of these half dozen families of flowers are so extraordinary and pronounced that the garden cannot be complete without them. Nasturtiums are exponents of all the variety possible in toned yellow and red; poppies present to us all the light and airy delicacy of color which is conceivable, in addition to red and scarlet in powerful hues; marigolds hold exclusively to yellow and its golden tones; phlox Drummondii reveals infinity in tint and hue and stops only at yellow and blue; sweet peas are crimson and pink and blue-purple to absolute perfection of tone, and asters are strong in purple-blues, purple and red tones in which the presence of yellow is absent—entirely and wholly so.”—*Ladies Home Journal*.

It is well known that winds play a an important role in the distribution of seeds. Prof. Bailey records that in two square feet of a three-weeks-old and three-inch-deep snowdrift upon an ice pond ten yards from any weeds, he found nineteen weed seeds, and in another drift similarly situated thirty-two seeds, representing nine kinds of weeds. While the wind was blowing twenty miles per hour, a peck of mixed seeds was poured upon the snow crust, and ten minutes after one hundred and ninety-one wheat grains, fifty-three flax seeds, forty three buckwheat and ninety-one ragweed seeds were found in a trench thirty rods from where they had been poured upon the crust.

APPLES.

R. H. BUTTERMORE, LAKE CITY.

In this district I am glad to report that this season apple trees have done well, better a good deal than we expected last year. The late frosts visited us again last spring, which I feared would do the apple trees a great deal of damage. On the nights of the 11th, 12th and 13th of May, 1895, there were very severe frosts—just when the apple trees were in bloom and looked grand, and I feared another short crop and more ill results to the apple trees, but to my astonishment they proved not to be so badly hurt after all and had quite a crop of apples. The late spring of 1894, and the intense prolonged drought stunted the trees so badly, that I was anxious to see how they would come out this summer, and to my pleasure they started from the frostbitten buds of the previous year and grew right along and are in splendid condition for next year's crop.

The most of my apple trees and what I have seen in my travels are doing well, but the Early Strawberry and the Minnesota blighted more than usual. A great many of our apples this last spring were wormy and deformed. I sprayed my trees three times, commencing after the blossoms fell off. The insecticides which I used were Paris green mixed with hellebore and once with salt. The results were not as I wished, but as to the destruction of a great many parasites and injurious insects I have no doubts.

I had some beautiful specimens of apples last season, had beautiful Whitneys and other kinds as delicious as pears. When we take the *light, healthful, invigorating* atmosphere which is infused into our Minnesota fruit into consideration, I think we can say we *beat the world in healthful fruit*. To show how the American fruit is appreciated in other countries, I will give you an article from a correspondent in Glasgow, Scotland, to the Farmers' Review, Chicago, Illinois. He writes as follows: "Fruit here is rarely eaten by the common people except when some brave youth has risked being jailed, and under the cover of night stolen a pillow-slip full. The orchards are watched like a jeweler's store in America, and the pains and penalties for picking even a fallen apple are excessively severe. Our apples are generally good and retail at from 7 to 15 cents per pound. Those from the United States are always most in demand and bring the highest prices. Notwithstanding the great imports from New York, Philadelphia, Chicago and other places, fruit is exceedingly scarce, and the common people never eat it except on special occasions"

I have a seedling apple tree which I prize very highly. It looks some like the Duchess, but the apple is firmer and a longer keeper. The tree *never blights* and is *as hardy as an oak*. It is about twenty years old, and has been bearing fruit twelve or fourteen years. Let it freeze or snow, *it always has a crop of fine apples*. I give it plenty of food by covering the ground a rod in width with coarse manure. Last year I had about six bushels from it, this year about seven bushels. I have now a good many seedling apple trees fit to transplant.

Last year strawberries with us were a poor crop. Raspberries were fairly good, also plums and grapes.

COMBATING DROUTH.

PROF. W. W. PENDERGAST, HUTCHINSON.

Ladies and Gentlemen: I know the hour is getting late, so I will take only a few minutes of your time in talking about a subject that was of great interest to me last summer while I was traveling through the western part of this country, especially along that semi-arid region in Washington, along the banks of the Columbia river and extending back fifteen, twenty or more miles from that stream. I never was so much surprised, so completely taken back in my life as I was to see what could be done with a region of country that I had been looking upon for more than a thousand miles as being absolutely valueless. It looks like a veritable desert. I went up the Columbia about twenty-eight miles, striking off to the right, up through the canon in the mountains in the Great Bend country, the Great Bend of the Columbia river, and at every step of the way I said to myself, it is an absolute Sahara. After about eleven miles of travel through that drear and desert country, I came to Mr. Taylor's little orchard of ten acres, and I felt a great deal like the traveler in the caravan going to Timbuctoo when he strikes an oasis. There in the midst of that great waste of what was apparently sand, there was the most beautiful orchard, the most promising I had ever seen or imagined to exist. I got out and went up through that orchard and saw those trees, every one hardy, strong, hale and promising, and almost every one of them thoroughly loaded down with fruit. You have no idea, no conception of the vast amount of apples, peaches, plums, apricots, mulberries and other fruit raised on those trees, and still that country is known the world over as a desert. The soil consists of volcanic ashes. It has come from those everlasting mountains, continually crumbling down, and as I looked up the side of them I found little pieces of shale that had been broken off by the frost and were sliding down. At one place I found a rock that weighed several hundred tons. This desert is covered with sage brush, greasewood and yarrow. Those are the three things, and the only three plants that grow naturally. This Mr. Taylor had found a little mountain brook with a stream as big as my arm. I saw he had brought it down the canon in the simplest form, two eight inch boards nailed together in the form of a trough. It was running down two rows of those trees; one-half ran down one row and the other half ran down the other row, and he had it so arranged that when the water had reached the end of his orchard it had all soaked in the ground. He told me that the next day he would run the water to the next row of trees, and the next day to another row and so on until all his trees have been watered; and when he got around to all the trees he then began over again. Since then I have heard from there that the lower limbs were all resting on the ground, the weight of the fruit had bent them down. On my visit there he had some propped up and tied to keep them from breaking.

A little ways beyond that I found another man who had an orchard which had no irrigation whatever; he had very fine fruit, about half as many apples as Mr. Taylor had, but not so large. But they also told me that those men who raised fruit without irrigation would

raise better fruit than Mr. Taylor could with his irrigation, but they had to pick off about one-half the fruit before it was ripe, and then the remaining half would not grow as large as that of Mr. Taylor's orchard which he had irrigated.

It interested me to find out how it was they could raise such fruit in such an unusually dry season as that was. I found upon inquiry that the secret of it was keeping a dust blanket about five inches deep on the top, and just as soon as there was a little rain—sometimes it does rain there in the spring or summer—just as soon as the rain is over they cultivate. The top soil must be kept loose and dry just like ashes for four or five inches from the top, and below that the roots reach down into a soil that contains water from the underlying strata of clay, about twenty, twenty-five or thirty feet below, and that moisture keeps working up during the summer. How does that water get there? It comes from melting snow. They get very little rain in the summer time, because it can never rain unless the air that contains that rain is cold; it must be cold before that moisture can be condensed so it can come down. In the summer time that is a warm country. The thermometer stood 108° in the shade the day I was up there. In the summer time the wind that comes over the mountains grows warmer and warmer instead of colder, so there is very little if any precipitation during the summer time; but in winter it is cold there, sometimes it gets nearly as cold as it does in Minnesota. The cold winds come in contact with the warmer atmosphere, and so there is a large fall of snow. The snow is sometimes nearly three or four feet deep, and the melting of this large snow fall causes this vast reservoir of water upon which they draw in summer; but unless they keep this dust blanket on the surface in the summer they cannot raise anything. I want to say here that in those orchards they had under irrigation the growth of the limbs was something astonishing. The people were very careful to see that nothing whatever grew in those orchards except the trees. I asked if they raised any grain or planted any vegetables in their orchards. They said they would not have a single thing that would draw the moisture out of the ground. That is something we have to learn here. They will not allow a single plant to grow in those orchards. Everything is just as clean as this floor. They will not allow anything to grow but the trees. Each tree gets all the water they can give it, and its roots run down deep where the water is coming up slowly by capillary attraction. I asked the depth to which they had to go to get their water for a well, and they told me twenty, twenty-five to thirty feet, and then they strike this clay, and on the top of this clay they strike an abundance of water.

It looked to me as though it would be impossible for a great many years to come to irrigate that country as a whole. They have got to go up the Columbia River about a hundred miles or so, and the banks are so very high that it is impossible to get the water from the river without ditching. The river is perhaps 150 feet below the bank, so you see that irrigation would be very difficult. The one thing which struck me as the most important was that nothing must be planted in the orchard that will take any moisture out of the ground that

belongs to the trees. They are as careful of their water as we are of the apple of our eye. They raise peas there for Northrup, Braslan & Co. They can get them in the ground very early. The pea is very hardy, and they can put them in the ground when it is very moist, and they come to maturity before the ground is dry, and at the time they are ripening there is no moisture on the surface, and the peas are the finest and best raised anywhere in the world. They are not troubled with mildew. That is why Northrup, Braslan & Co. send out there for their seed peas. The principal point is then that we must be careful in this country, where drouth is our great enemy, drouth in August and September and the latter part of the season, we must be careful not to allow anything to grow with our trees that will steal the moisture that the trees demand. This is the great lesson I learned in the region along the valley of the Columbia river. (Applause).

Pres. Underwood: I think this is a very valuable lesson to us who have orchards. I want to say that the largest and best orchard we have in the state of Minnesota is just perishing for lack of that kind of cultivation Prof. Pendergast has told us about. It stands there with a mound of earth around each tree, all grown up to sod, in a condition in which drouth would be the most damaging, and I believe if that orchard is not taken care of it is a question of a short time only when there will be no orchard there at all. It seems to me if the owner of that orchard could hear Prof. Pendergast talk as he has talked to us today, he would not allow any time to elapse before he would put that orchard in such a condition as has just been spoken of here.

USE TILE DRAINS.—Thorough draining with tile will often cost as much as the present worth of the land, but when the work is once properly done, it is done forever. The station fields which have been tile drained have increased their annual yield fully fifty per cent as a result of the work, and such drains will be found a profitable investment on all soils which remain wet until late in the spring on account of their compact subsoil or which are rendered heavy and "sour" by continued seepage from surrounding hills.—*Mississippi Experiment Station.*

HOW A GOOD ROAD SAVES MONEY.—An officer of the New Jersey Agricultural Society used to draw manure with four horses from Philadelphia to his farm, seventeen miles away. A new road was built half way; two horses drew the same load to the end of it; then he had to send a man and team down to bring it the rest of the way. Finally the road was completed the whole way. One man and team do more work now than two men and two four-horse teams did before. He saved \$120 on hauling his manure the first year. The road didn't cost him \$20. Other farmers, instead of 30 baskets of potatoes which used to be a load, now carry 90.

FIGHTING THE CUT-WORM.

BY PROF. OTTO LUGGER.

(Extract from Minnesota Experiment Station Bulletin No. 43.)

The term cut-worm applies to caterpillars which have the injurious habit of cutting off or cutting into the food plants so as to wilt or kill them. Usually this takes place in the early spring and only very seldom later in the season. This peculiar habit, so well known to farmers, gardeners and florists, is evidently caused by the fact that such caterpillars prefer wilted to more succulent food. This preference for wilted food seems to be a very general rule among all insects, since but very few enjoy very succulent foliage, but become sick if forced to consume it. Preferring more mature leaves or foliage not filled with sap, they select this more suitable food later in

The cut-worm and its parents the owlet moths.

the season, and as at that time there is an abundance of it the caterpillars are not forced to prepare it for themselves by cutting off the plants. Early in the spring, matters are different; all the plants are just unfolding their new foliage or forcing their first delicate leaves full of sap towards the light. The warm and genial air of spring, which starts all vegetation for a new cycle of life, also awakens such young caterpillars as hibernate. After the long fast, enforced by cold and absence of food, their natural voracity is still greater than usual, and they are not slow to attack their food-plants, which are, however, not yet in a suitable condition, being still too watery. The only way for the caterpillar to overcome this state of

affairs is either to continue starving and wait for better times or to solve the question of food supply by cutting off the succulent plants and wilting them. This done, the food is in a palatable condition for them. For this reason we have cut-worms only in the spring and not late in the season.

This peculiar habit of cut-worms of preparing their food is a habit we can make use of to lessen their injuries and to kill them. Knowing that such insects prefer wilted foliage, we can supply this and be certain that they will accept such a kind invitation by eating the food. If we poison the wilted food we furnish our enemies, the cut-worms will be killed in large numbers. The proper way to carry out this plan is to tie together small bundles of such plants as grass, clover or any surplus of young cabbage plants we may have to spare. These bundles, which should be about three inches in diameter, after being dipped in water containing a large amount of Paris green or London purple, are now laid among the rows of plants that we wish to protect, and our traps or baits are ready for action. The bundles should be laid about six feet apart and only in such parts of the fields or gardens as will be first reached by the cut-worms. Close attention will show that not all parts of the garden or fields are equally infested with cut-worms, but that they invade certain places from one or more well defined directions. As cut-worms hibernate, they usually select such suitable places as offer superior shelter and good drainage, consequently, the more elevated parts of the ground or soil well overgrown with grass. The former gives good drainage, the latter good shelter. Such places can be easily detected in any garden, and by laying our traps in their vicinity most of the cut-worms will find them and be killed before reaching other parts of the field. Whoever applies such remedies must not expect that he will find large numbers of dead cut-worms on the surface of the ground or under the bait, as such is not the case. The caterpillars, having eaten of the prepared bait, soon feel the effects of the poison and will be kept running about by the resulting pains. In a number of cases, where crops of onions were badly infested and where this remedy was applied, a close search was made for dead cut-worms. It was found that under the baits a number of cut-worms were dead or in a dying condition, but more were found as far as ten feet from the baits. These dying cut-worms were not found on the surface of the ground, but they had burrowed into it in the usual way and were dying in such situations.

Another and a very effective bait is also an excellent one to use against cut-worms. It is a bait made of rye flour or rye and wheat bran mixed well with one of the arsenical poisons. The mixture should contain enough Paris green or London purple to become distinctly colored by these substances. If a tablespoonful of such bait is dropped near the plants to be protected, the worms will not be slow to find and to eat it. Such baits are especially valuable in case the plants to be protected are grown upon land which but shortly before was a meadow, pasture or timothy field, as fields in which the sod has not been disturbed for some years form the

homes and very headquarters of cut-worms. In such a case, the baits should be prepared and laid before the young plants appear above the surface of the ground.

There is another habit of the cut-worms, which we can make use in combating them. They, like some more highly organized beings, do not like to work more than is absolutely necessary. As it is important for them to hide under the soil or elsewhere during the day so as to escape their enemies, they are forced towards morning, after each nocturnal feast, to burrow again or search for shelter. This they do, as a general rule, close to the plant that they infest. If we furnish them a handy shelter, they will very often utilize it. By placing on the ground near the plants to be protected such objects as pieces of boards, shingles or even flat stones, we induce many cut-worms to utilize them as shelters, and here they remain all day. Large numbers can thus be discovered and captured during the day and should be killed.

Though there are a number of climbing cut-worms which infest orchards, we have not many in Minnesota that injure fruit trees. If trees should suffer, however, it is not difficult to prevent the worms from reaching the foliage. All that is needed is to make a thick ring of "Raupenleim" around the trunk; this sticky material will prevent any insect from crawling over it, and as it possesses at the same time a strong and repelling odor it is a very useful material for many purposes. The great majority of our native species do not climb and are very much opposed to undertaking such extra labor. Indeed, it is doubtful if some of our cut-worms could climb trees if they wanted to. At all events they can not climb upon anything that is smooth, and their inability to do so gives us another method to out-general this enemy. The remedy based upon this habit can not, however, be applied upon a large scale, as it requires considerable labor, but whenever only a few hundred or thousand plants need protection it can be used with great success. By removing the tops and bottoms of tin cans, that can be found in such abundance almost anywhere, and by removing the solder, we have an excellent material to protect our plants against cut-worms. The best method would be to have strips of such tin about three inches wide and long enough to be bent into a circle at least an inch and one-half in diameter. These strips are to be bent so as to form a sort of spiral collar, which can be slipped around the plants very readily without endangering their leaves. This protective collar should be pressed into the ground at least an inch deep, so that the plant is as thoroughly protected against the cut-worms from below, provided, however, that the culprit be not inclosed within this circle. Such tin collars can be made during the time when there is little work on hand, and once made, if taken care of, they will last for many seasons. They are readily applied and as readily removed when the danger is over, when they should be stored away for future use. Of course, other substances could be substituted for such tin collars, such as stiff paper, but such substitutes never last as well as those made of tin, and a heavy rain is apt to ruin them, nor are they so readily applied as the more elastic collars of metal.

There is still another way to protect our plants against cut-worms, and a very simple and effective one at that. Cut-worms, like all other caterpillars, chew their food, and by coating the plants to be protected with either Paris green or London purple, we can readily poison the caterpillars that attack such plants. This method would be a very simple one if all gardeners and farmers possessed good spraying machines which would spray uniformly all the exposed parts of the plants, of course including the stem, but such is not the case. Besides, in many cases the stems of young plants are cut off below the surface of the ground where arsenical poisons can not be applied. One thing is certain, that farmers, gardeners and florists can prevent any great loss by cut-worms if they apply one or more of the above remedies in a thorough manner.

APPLES.

J. P. ANDREWS, FARIBAULT.

The apple crop in the vicinity of Faribault the past season (1895) was one of only partial success. Orchard and nursery trees came through the past winter (1894-5) in good condition. The unusually early spring weather, however, forced the blossoms prematurely, and they were severely cut by the late freeze, which occurred May eighteenth to twentieth. Orchards on elevated locations and on northern or northeastern exposure escaped with less damage to crop than those located on lower ground or southern slope, unless such had extra protection.

The apple crop has now been damaged two consecutive years; in fact, a year ago it was an entire failure from this same cause, the late spring frosts. One of the remedies to be applied is mulching after the ground is well frozen in winter,—and when, as at the present time, snow comes before freezing weather, it would need to be cleaned off from under the trees to permit the ground to freeze sufficiently before the mulch is applied. Shading the bodies would also be in order. Elevated location is one of the best preventatives.

Some orchards in our neighborhood bore very little, others had a fair crop; on the whole, we should think there was perhaps one-third to one-half of an average crop of fruit. There has been very little, almost no blight, yet we have had an unusual amount of moisture, but not so extremely hot as in seasons of much blight. Both orchard and nursery trees have made an excellent growth.

The market price was good for all home grown fruit, which when compared with the exceptionally low price of grain and other farm crops, makes the orchard stand, as usual, *the most profitable investment on the farm.*

We planted our orchard in 1878 on an elevated location and a slightly northern slope with a windbreak on the south and east. The trees stand fourteen feet apart each way and leaning well to the southwest. The varieties are mostly Duchess, Wealthy, Orange, Whitney, Early Strawberry, Virginia, Maiden's Blush and a less number of several other varieties of hybrids and a row or two for trial of Haas, Tetofsky, Peach, Walbridge, Ben Davis, Price's Sweet, Fameuse, Perry Russet, Pewaukee, &c. Most of these trial trees

have gone, with the exception of Haas and Tetofsky, but the main orchard has proved profitable and is now in a thrifty condition with the exception of the Wealthy. This variety has borne enough to pay its cost many times, but fully one-half of them are now dead, and the rest have the appearance of not being long-lived trees. The Orange have blighted some, but none of the others have been seriously troubled with blight. We have mulched the Duchess and Wealthy about every second year, in winter, the others not so often, and have pruned very little.

The orchard is in grass and pastured with hogs. The trees stand too close to drive between the rows conveniently. We hope to plant another orchard in the spring and shall plant about fourteen feet apart, in rows running north and south, and have the rows about thirty feet apart east and west.

Our Peerless apple trees, one and two years old, made the best growth of anything in the nursery. The Peerless on low, rich ground makes rather late growth, especially while the trees are young, but on higher locations and as they get older they ripen earlier. We have some Peerless top-worked on Whitney, Virginia, Dartt's Hybrid and Wealthy, making generally a good union with these varieties. Those grafted into the Wealthy bore some fine apples this year for the first time, in fact, so good that boys who had the run of the place got all the finest specimens before they knew it was a "patent" apple.

DISCUSSION.

Pres. Underwood: This is the only report we have from the committee on apples. Now, we have plenty of others here who are competent to report in regard to apples this last season, and we would like to hear from Mr. Somerville.

Mr. Somerville: Well, with us our apple crop was a fair crop. In my own orchard, I had a very good crop of apples. We had a hailstorm there on the 4th of August that knocked a great many off, and the balance were so badly battered that they did not keep well this winter, so the greatest objection I have is as to the quantity; the quality was all right if it had not been for the hailstorm. In looking over our exhibit today in the other room, I am quite surprised to see the advancement that has been made in fruit raising in Minnesota. I exhibited the first fruit that was ever exhibited in the state at the first state fair held in Rochester. I had the Duchess, and I exhibited that at the first fair. At the next one I had the Duchess and the Transcendent exhibited, and I took all the premiums that were offered, because there was no one to compete with me. (Laughter). The third year Mr. A. W. Sias had a few Duchess and a few Transcendent crabs, and he was a competitor. Those Duchess were set out in 1860 from which the apples

were taken which I exhibited at the first state fair, and I have apples on exhibition out in the other room that were taken from the identical tree, and that tree was set in 1860. It has stood remarkably well and has never missed a crop of fruit. My crop of small fruit this year was not as large as I have had; I did not get my small fruit covered up, and hence it was injured by the cold weather last winter, but yet, withal, I had a fair crop, and my apples were a good crop. I do not know that I can say much more about this subject.

I have set out a new orchard. It was set out four years ago, and I have specimens of pretty nearly all varieties of apples in that orchard. I set out that orchard so it would be one of those commercial orchards where we do not want too many varieties. I set out the majority of those varieties that we know will give us fruit. I set the trees $16\frac{1}{2}$ feet apart each way. Then I went to work on my experimental trees and set rows of them between, and only a few varieties of each. The varieties I set for commercial purposes were the Glass Green and the Duchess. The former I think is a little better; it is not quite so tart; I think the fruit is a little better than the Duchess. I have the Wealthy and the McMahon White, Budd's Seedling No. 1, and I have also the Okabena, and I have Patten's Greening. I have those set out in my regular orchard. I have other varieties set out between, so that I occupy the whole ground. In experimental trees, I have eighty odd varieties of Russians, and I have every seedling that is before the public; when they get too big it is an easy matter to get them out, but I want them for the purpose of seeing what the fruit will be. They have fruit enough to pay for all the labor, and they will not interfere with each other for a number of years. By having them in a small space, we care for them better. This year the great majority of them fruited. I have a great many valuable varieties there, and I know it, but in the course of a year or two I will know better. They have all made a fine growth. I am very thankful to the Lake City folks for sending up the Okabena and the Thompson Seedlings. The hailstorm injured all the Thompson Seedlings so badly that I have none to show now. I think in a few years I will have something that is very valuable. I have not got the Peerless.

Mr. Sampson: Why don't you have the Peerless?

Mr. Somerville: Well, in the first place, there was such a corner on it that I could not stand the conditions, that if I put it out I must not sell or give away anything, and I thought if I

had anything of my own I wanted it separately, or I did not want it at all.

Pres. Underwood: What amount of fruit did you get off that Malinda tree that was so heavily loaded?

Mr. Somerville: I have a Malinda tree about twenty years old; it is top-worked on the Transcendent crab. Two years ago I picked four sugar barrels full of apples off that tree. Last year it had an ordinary crop, perhaps a barrel. This year, I am satisfied, there were thirty bushels on it. I do not think I ever saw a tree so heavily loaded as that was. It was so thickly loaded with fruit that it broke off limbs six inches in diameter.

Mr. Kimball: How long is it since that Malinda tree was top-worked?

Mr. Somerville: About twenty years ago.

Mr. Kimball: When did it come into bearing?

Mr. Somerville: It had been top-worked three years when it came into bearing, and it has borne every season since. I have Malinda apples on exhibition that were top-worked three years ago. When you raise them from little trees they are some time coming into bearing, but top-worked they come into fruit very soon.

Mr. Brackett: Would not the Transcendents affect those other young trees that are planted there by blighting?

Mr. Somerville: I cannot say. Wherever they have blighted, I have dug them up. I have tested about three hundred varieties of Russians, and those three hundred I have simmered down to eighty varieties, and those eighty varieties are the ones I have been experimenting with, and two or three varieties do not blight in the least.

Pres. Underwood: How many apples did you grow this year?

Mr. Somerville: About 1,500 bushels.

Pres. Underwood: What did you average in price per bushel?

Mr. Somerville: I sold them to shippers for 60 cents a bushel. We sold our Transcendents for 60 cents and our Duchess for 60 cents. We did not have many Wealthy.

Mr. Andrews: How did your Longfields do?

Mr. Somerville: They bore very finely, and I also sold some of those, but we use a great many in our family, and I have got a good many in the cellar yet.

Pres. Underwood: How did the other orchards in your vicinity do?

Mr. Somerville: The other orchards in our vicinity did about as usual; they had a fair crop. I think Mr. Keel's orchard was well loaded, and pretty nearly every farmer has more or less trees on the farm, and they all had an average crop.

June Calendar.

J. S. HARRIS.

ORCHARD AND NURSERY.—With newly planted trees, it will pay to give a little time every few days to examining their condition. If they are loose or leaning to one side and toward the north, a minute spent in pressing the soil about them with the foot will often save them from sunscald and prevent them from becoming unsightly objects. A mulching, if not already given, should be provided to enable them to withstand the heat and drouth that is almost sure to set in a little later; almost any substance that will cover the soil from the sun will do.

It is a great satisfaction to know the names and location of the different varieties in the orchard. The labels from the nursery are soon lost, or the name becomes obliterated, and a record of the name and position of every tree should be made in a pocket memorandum book.

Grafts set this spring should be looked to. Cut away all shoots that come upon the stock below the graft, that they may not rob it of nourishment, and if the graft is spindling up too tall it may be pinched back into shape. See that they have plenty of room and are not interfered with by surrounding branches.

June is the best month for light pruning and getting trees into proper shape; and all pruning should be attended to while the branches are so small that it can be done with a penknife. Cover all cuts with varnish, paint or melted grafting wax.

Whenever young trees are bearing freely, it will pay to thin the fruit. Overbearing exhausts the vitality of the tree, and liberal thinning increases the size and improves the quality of the fruit.

The root grafts set this spring should be cultivated often and kept clean from weeds, and the one year and older trees will need pruning and putting into shape; and, if it is not delayed too long, it can be mostly done by rubbing off the sprouts not wanted as fast as they start.

INSECTS.—This is the season when insects are getting in their work. Most of the kinds can be kept in check by spraying the trees with Paris green or London purple. For the plum curculio and apple gouger, jarring the trees and catching the insects on sheets spread under is safer than poison. Great numbers of the codling moth can be trapped under hay, paper or cloth bands, which should be examined once a week and the insects found under them destroyed. About this time the eggs of the borer are deposited on the trunks of trees. One of the best preventatives is washing the trunks and larger branches with soft soap thinned to the consistency of whitewash. The addition of a small quantity of carbolic acid will prove beneficial if care is taken to keep it off the foliage. Rubbing the bark of the tree vigorously once a week during the month with a corn cob crushes the eggs and young larvæ before they burrow under the bark. Placing a heap of tobacco stems around the butt of

the tree acts as a preventative. Where any nests of the tent caterpillar are seen, they should be pulled off and tramped upon, or they may be killed by rubbing the nests out with a swab saturated with kerosene or soft soap.

STRAWBERRIES.—In the bearing beds, keep the soil well mulched between the rows. The picking and packing for market requires great care and good judgment. All over-ripe berries should be excluded—one such will often spoil a whole box. To bring the best prices the berries in each box should be of uniform size and ripeness and in full, clean, new packages.

Every blossom and berry should be kept off from plants set this spring, and frequent cultivation given to encourage a strong, healthy growth, and where the matted row system is practiced the formation of plants from the earliest runners should be encouraged by pegging them down or placing a lump of earth over them.

RASPBERRIES.—The green shoots that are growing now are the ones that bear next year's fruit, the fruiting ones this season dying after the berries have ripened. When the growing shoots of black-caps reach two to three feet, the points should be pinched out; but the red varieties are better without cutting back before the end of the season. All canes and suckers not needed for fruiting next year should be treated as weeds and promptly removed.

Give thorough tillage with horses and hoe until the fruit is well formed, then apply liberal mulching to keep the fruit clean and ground moist. Fresh mown clover is the best material for the purpose.

BLACKBERRIES.—Blackberries require much the same treatment as black raspberries, but the young canes may be allowed to grow a little longer before pinching.

GRAPES.—Grape vines set this spring should grow only one shoot, leaving the lowest if it is a strong one and pulling off all others. The young shoots of bearing vines should be tied up before they fall over or are broken by winds. Pinching off the bearing canes once as soon as three good leaves have formed beyond the last cluster is beneficial, and the laterals that form afterward may be pinched off once beyond one good leaf. Water shoots and surplus canes should be pulled off, but further summer pruning is damaging to the health of the vine.

CURRANTS AND GOOSEBERRIES.—These will need looking after, and shoots that are not wanted that start on the plants should be pulled off. Watch for worms and apply white hellebore as soon as any are discovered. A tablespoonful of the powder to a pailful of water applied with a syringe or sprayer is the most common remedy.

THE KITCHEN GARDEN.—This is the time when a little work with rake and hoe count most. Weeds must be kept down and the surface soil fine and loose to get the best results.

The cutting of asparagus should be discontinued towards the last of the month and a liberal dressing of manure applied to the beds. Keep the weeds and grass out.

Beans, beets, carrots, cucumbers, sweet corn, etc., may be planted for the main crop, and the earlier plantings should be thinned and kept clean from weeds. Cabbage and cauliflower need frequent hoeing. Set plants for late use toward the end of the month.

Your Corner.

"I have received one of the monthly issues of your society organ and think this a very sensible and profitable thing. It brings the news of a horticultural nature to those who need it in a plain manner and also when they need it."

Parksley, Va., April 20, '98.

H. E. VAN DEMAN,
(Late Pomologist U. S. Dep't Agriculture.)

"My apple trees are looking fine, have had no blight nor lost a tree for several years. Hope to have some apples some time—I mean a plenty. I have a hundred trees and many varieties."

Morris, Minn., April 28, '98.

D. S. WHEATON.

(The location of Morris on the open prairie, 150 miles or so northwest of Minneapolis is not a favorable one for apple growing, and Mr. Wheaton's success shows much intelligent care. SECY.)

INJURY TO GRAPE-VINES AT MINNETONKA.—Many of the persons living around Lake Minnetonka are anxious about the condition of their vineyards. The vines are starting poorly, and in some vineyards many vines of the tender sorts, such as Duchess, Lady and Moore's Early, are not showing any growth at all. I spent a part of last Monday (May 18th) in that vicinity and made a careful examination of the vines. The wood generally appears fresh, but without exception all varieties that were examined showed considerable injury to surface roots—in many places this was serious. It is not uncommon to have the surface roots of grapes killed, and where vines are set deep in the ground no serious harm comes from this source, since the deep roots are not often injured. This year, however, even the deep roots are generally discolored. The young vines have suffered most. In addition to the winter injury, the leaf hoppers are injuring the foliage. These injuries have been so bad that one party has dug up a large number of his Moore's Early vines, and other growers have felt they must do likewise.

Where the vines are starting at all, it seems to me rather premature to dig them until after midsummer, since the recuperative power of a well established grape is often surprising, and I think many vines which now look very weak will have recovered by that time. But cultivation should be commenced at once and the ground kept well stirred and the vines favored in every practical way.

St. Anthony Park. May 22.

PROF. S. B. GREEN.

FRUIT PROSPECTS.

The prospects for all kinds of fruit except strawberries are extra good. Farmington, May 30, 1896. D. F. AKIN.

I find that our apple crop is not going to be very large this season, and there are not many currants. Strawberries, raspberries and blackberries are budding well, although there was a considerable failure in strawberries, owing to their going into the winter too dry and there not being any snow to cover them.

Lake City, May 23, 1896.

J. M. UNDERWOOD.

"Those who have strawberries expect a fair return; currants will not yield over one-third a crop; raspberries of all kinds, also blackberries, promise an enormous yield. I think the apple crop, like my own, will be very light, while grapes look very much better than the early spring gave promise, and where the vines were not actually winter-killed will bear well."

Excelsior, June 1, 1896.

MRS. SOPHRONIA IRWIN.

"The prospect for a good fruit crop in this locality was never better with the exception of currants; they are a very light crop. Grapes will not be quite up to the average. Apples are well loaded. Berries of all kinds promise an abundant crop. The "Loudon" raspberries came through the winter in splendid condition and are loaded with fruit, without any protection whatever."

Eureka, Minn., June 1, 1896.

C. W. SAMPSON.

At present in this locality the prospects are good for an apple crop. The plum crop will be light; the cold nights and light frosts in blossoming time injured them. Strawberries blossomed well, but a great many are blighted from some cause. It is too soon to predict about raspberries, as they are beginning to bloom. The prospects for a grape crop fair.

Lake City, Minn., June 2, 1896.

R. H. BUTTERMORE.

"Last year's planting of strawberries, from total failure to one-fourth crop; old beds average about one-half a crop. Raspberries—reds, one-half crop, blackcaps, a very large crop. Currants, few. Cherries, few. Goosberries, none. Blackberries, bearing well. Plums, much fruit blighted, but enough remains for a good crop. Grapes promise a large crop. Apples uncertain; spur blight has thinned down the Duchess, Tetofsky and McMahon badly in the valleys, and other varieties are beginning to drop; present indications are for about three-fourths of a full crop; said to be better on the ridges. The failure in strawberries is similar to but worse than in 1893."

La Crescent, June 1, 1896.

J. S. HARRIS.

The prospect for apples is fair, though many trees that bloomed bountifully set little fruit, and this is especially true of cultivated plums. Of one hundred or more trees girdled last season to hasten fruitfulness, three or four died, probably from effects of blight, and nearly all the others are carrying fruit. I am girdling rather extensively this season—commenced the 20th of May and will continue up to July 1st and to very limited extent later on. In this way I can

soon find out the kind of fruit seedlings will bear and hope to get a paying crop from overgrown nursery trees standing closely together that are only four to six years old.

E. H. S. DARTT.

Owatonna, May 29, 1896.

"Will give you a short report on fruit prospects in southwestern Minnesota. Plums are a failure. There will be some Desota and Wolf; the best is the Surprise—about half a crop; Stoddard, Forest Garden and others, not any; a few North Star. The blossoms did not last over two days on account of warm and high south winds. Apples seem to be in a better condition. Currants and gooseberries very poor. Strawberries, mostly winter-killed. Caterpillars are numerous on wild plums. I had to fight them a good deal this spring. My trees are clean of them at present. Will send you report later."

MARTIN PENNING.

Sleepy Eye, May 15, 1896.

THE PEERLESS.—"We have had the variety on trial at our place a number of years and took first premium on the fruit at the late apple show in Minneapolis, but out of about 100 varieties on trial we consider it among the least hardy of the lot and are firmly of the opinion that the first genuine Minnesota winter we have will seriously cripple the tree. It never seems to know when to stop growing in the fall, harden up and get ready for winter. Those who have it growing on their places will have noted its habit of holding its leaves well into winter, which is recognized among well posted horticulturists as an evidence of lack of hardiness. The fruit is very pretty in color, but not nearly so rich and taking in the market as the Wealthy and, unlike the latter, is frequently ridged and irregular in form. As to its being a true all-winter keeper, it belongs to that class that, like the Wealthy, may with care be kept several months in favorable seasons, but is not for a moment to be compared with the Northern Spy, Ben Davis, Malinda or other thorough going keepers. Mr. Brand urges the health and productiveness of the original tree, while the behavior of the parent tree is absolutely no certain indication as to how the trees grafted from it will behave. The original Peerless tree is seriously injured and is now held together by a chain in the branches. Mr. Miller, the originator, says it is a seedling of the Utters Red instead of the Duchess, and all the talk about its being the product of a cross between the Duchess and Tallman Sweet had its beginning in a fertile imagination and lacks the slightest foundation on actual observation."

CLARENCE WEDGE, in F. S. & H.

AMMONIA IN RAIN WATER.—Nitrogen being a costly plant food and one which the farmer usually has to buy each year, the amount of it contained in rain water in the form of ammonia and nitrate is of interest. Though the amount, which is equivalent to three and a half or four pounds of ammonia to the acre per year, is apparently small, yet it is half as much as is usually applied in fertilizers. —*Mississippi Experiment Station.*

Secretary's Corner.

NATIONAL NURSERYMEN'S ASSOCIATION.—This organization will hold its annual session in Chicago, June 10 and 11.

COL. J. H. STEVENS has been quite ill the past week, but is now much improved, and we hope to see him out again in a short time.

CUT WORMS.—Read carefully the very practical article on this garden pest taken as an extract from a late bulletin of the Minnesota Experiment Station. It is full of valuable information for the horticulturist.

COST OF EXPERIMENT STATIONS.—Congress has appropriated \$750,000 for the various Agricultural Experiment Stations. It is money well invested and gives promise of certain improvement in varieties and methods.

SUMMER MEETING OF WISCONSIN HORTICULTURAL SOCIETY.—Secy. Philips writes that their summer meeting is to be held at Wau-paca, Wis., Tuesday and Wednesday, June 16 and 17, and intimates that Prof. Goff and himself may attend our meeting. They would be vigorously welcomed.

SPRAY YOUR GRAPE-VINES.—On another page in this number, I have given from my own experience, brief directions for spraying, to guard against the downy mildew which is so destructive especially in wet seasons, as this gives promise of being. It is indispensable for the commercial grower.

SHADE TREE PLANTING.—City Park Engineer F. H. Nutter is authority for the statement that 1200 shade trees, all white elm, which at forty feet apart would extend on both sides of nearly five miles of street, have been planted by the Park Commission in the streets of Minneapolis. In time this will be a real "city of elms."

IOWA FRUIT PROSPECTS.—"Western Garden" (Des Moines, Iowa,) reports an unprecedented planting of nursery stock in that state this spring and that fruit trees have wintered well and promise one of the largest crops ever grown there. Small fruits however, are only in fair condition, with grapes perhaps one-third a crop.

REPORTS FOR DISTRIBUTION.—There is still quite an assortment of reports of other societies and U. S. and state experiment bulletins at this office for gratuitous distribution to the members of this society. A package will be made up and sent by express to any who request it without expense except the express charges.

SUMMER MEETING OF THE MISSOURI SOCIETY.—The annual summer gathering of this Horticultural Society convenes Tuesday evening, June 2d and holds three sessions on the day following and one Thursday morning. They meet at Jefferson City, the state capitol, for the first time in seventeen years.

DEATH OF D. D. MERRILL.—Mr. Merrill was an old settler of St Paul and well known as the head of a large book and stationery house there. His death occurred May 21st, after a short illness. Mr. Merrill has been an interested member of this society for a number of years, his name appearing on the roll first in 1885, though as far as known to the writer he did not attend the meetings of the society.

NO IOWA REPORTS FREE.—Iowa State Horticultural Society has adopted the policy of sending its annual report only to members, or those who send the amount of the annual fee \$1.00, though reports of previous years are sent prepaid at fifty cents each, or when four or more are taken at twenty-five cents each by express at the expense of the purchaser. They advertise "No reports for free distribution." This plan has much to commend it.

DECEASE OF ANDREW S. FULLER.—This celebrated horticultural writer passed peacefully away at his home in Ridgewood, N. Y., on the morning of Monday, May 4th, last, at the age of 67 years. Probably no writer on the subject of fruit culture is so well known in this country as he, as his books, "Small Fruit Culturist," "Grape Culturist" and others of equal merit are universally owned and consulted by fruit growers. Mr. Fuller was no theorist but acquired his knowledge in the greenhouse, nursery and garden before occupying the editorial chair. His work will certainly "live after him."

ANOTHER METHOD OF BUDDING.—A new method of budding trees and cutting during the winter, when the sap is dormant, has been reported upon by the Texas station. A slice of bark was cut down the stock and left attached at the lower end. Part of the top of the loose slip was cut off and the bud fitted over the cut place and bound firmly on with a piece of raffia. The stocks were kept in sphagnum moss till spring, when all but one of the 50 young peach trees used in the experiment were found to be heavily "knit" and made strong shoots in the growing season.

THE FRUIT GROWERS ORGANIZE. At a meeting of prominent fruit growers from all parts of the country held in Chicago, May 21, it was decided to form an organization to be called the American Fruit Growers' Union. A plan of association was drawn up, which includes the various state unions, each of which will send representatives to the national body. The officers elected for the first year are: John D. Cunningham, president; Willis Brown, secretary. The object is to combine the fruit growers of the whole country into an organization in which they may co-operate in shipping and selling, to their mutual advantage and profit.

THE CANADIA HORTICULTURIST (GRIMSBY, ONTARIO.)—The May No. of this monthly contains an account of a competitive trial of eleven different makes of spraying pumps with a statement of their comparative merits. This is followed by a general paper by the editor on the subject of spraying. Much attention is evidently paid to this subject in Canada, and its importance well understood. This magazine is issued by the Ontario Fruit Growers' Associa-

tion apart from and in addition to the annual report of the society. It is an especially practical journal as well as handsomely gotten up, and would be found a valuable supplement to our own monthly.

MINNESOTA STATE FAIR, 1896.—The premium list of the approaching state fair is now out, and copies will be sent to all upon application to Secretary E. W. Randall, Hamline, Minn.

On account of its being held at the time of the National Encampment of the Grand Army of the Republic, which meets in St. Paul that week, and the consequent very low railroad fares, an extraordinary attendance is anticipated, and the management are putting forth unusual efforts to improve, if possible, on the excellent fair of a year ago. The Horticultural Society should and, we are sure, will do all that can be done to contribute its share to this end.

MONTANA'S HORTICULTURAL SOCIETIES.—Besides the State Horticultural Society, Montana also boasts a Fruit Growers' Association, which was enthusiastically launched at Missoula, February 20th last. The state society held its meeting at Stevensville, February 13 and 14, the week before. What the peculiar circumstances are that make it advantageous for so young a state to support two horticultural societies are not known. The reports of the two meetings are published in full in Vol. I, No. 12, of the "Montana Fruit Grower," and are records of two very interesting meetings. They seem to be the official reports. The fruit industry is evidently arousing much enthusiasm in that state.

REVISED KITCHEN GARDEN PLANTING TABLE—R. S. Mackintosh has taken the Planting Table published in the April No. of the "Horticulturist," as copied from the "American Gardening," and by curtailing it somewhat and making a few changes made it *specially* applicable to this state. As originally published it was prepared for general use in the Northern States. As revised it appears in the May 1st issue of "The Northwestern Agriculturist," Minneapolis. A card board copy ready for framing can be had of the publisher for 5 cts., and it is worth much more. Mr. Mackintosh is well fitted by experience as a practical vegetable gardener in our state to revise this table, and we are very glad he has taken the trouble to do so.

ORGANIZATION OF THE MONTANA STATE HORTICULTURAL SOCIETY.—This society is incorporated as a regular stock company, with a capital stock of 2,500 shares of \$10 each, and the stockholders have the entire control and management of all the affairs of the society. If agreeable, by vote of the society others than stockholders may become annual members of the society by paying an annual fee of \$1 or life members by paying \$10, but such members have no voice whatever in the management of the affairs of the society, except in fixing the time and place of the annual meetings. Such members, however, may attend the meetings, take part in the discussions, &c. This is certainly a novel plan, but as it has been in operation only since May, 1895, its practical working is yet to be tested.

THE SAN JOSE SCALE.—This destructive insect pest is gradually gaining a foothold in the East and will, doubtless, soon be added to the already long list of enemies for the horticulturist to combat: Says the last report of the Connecticut Experiment Station:

"The Atlantic states, however, were supposed to be uninfested until the summer of 1893, when it appeared upon orchard trees in Charlottesville, Va. It was soon discovered that the scale existed at De Funiak Spring, Florida; Bartle, Indiana; Neavitt and Chestertown, Maryland; Lewisburg and Atglen, Pennsylvania and in several localities in New York and New Jersey. It has recently been found in Delaware and on Long Island. The introduction of the San Jose scale into the Eastern states has been traced to the importation of Japanese plum trees into New Jersey from California.

STATE PAPERS PUBLISHING OUR FRUIT LIST.—The list of papers following, comprises those which sent to this office marked copies, published in February last, containing the fruit list of the society and reference to it. The state papers have very generally shown an earnest desire to co-operate with this society in its educative work. This list must not be presumed to include all which published the list, but only those from whom copies were received:

Commonwealth, Duluth; Record, Pine Island; Review, Mankato; Republican, Tracy; Sentinel, Lake City; News, Chatfield; Star-Farmer, Renville; Pioneer, Currie; Journal, Mankato; Sherburne Co. Times, Clear Lake; Post, New Ulm; Herald, Little Falls; Washington Co. Journal, Stillwater; Journal, Owatonna; Democrat, Wabasha; Democrat, Faribault; Mascot, Minneota; Rural Center, Walnut Grove; Union, St. Charles; News, Plainview; Pilot, Jackson; Renville Union, Bird Island; Sentinel, Dawson; World, Staples; Buffalo Gazette, Delano; Dodge Co. Record, Dodge Center; Republican, Aitkin; Gazette, Hastings; Ugebladt, Fergus Falls; Ledger, Mankato; Union, Anoka; Star, Stewartville; Review, Grand Rapids; Progress, Minneapolis; Herald, Sleepy Eye; Pilot, Jackson; Gazette, Slayton; Arbitrator, Lakeville.

SPRAYING GRAPE-VINES FOR DOWNY MILDEW.—The Delaware and Rogers' Hybrid grapes especially need to be sprayed to insure exemption from this form of mildew. The first application should be made when the young shoots have grown a few inches and repeated thereafter during the months of June and July, at intervals of about two weeks or a little less. In my own experience, the ammoniacal copper carbonate solution has proved effective. This is prepared by dissolving copper carbonate in full strength ammonia (26° Baume) and adding water in the proportion of eight gallons to one ounce of copper carbonate. In dissolving the carbonate, be careful to add no more ammonia than just what is required to dissolve it, pouring it in slowly and stirring thoroughly. A surplus of ammonia will burn the foliage. Apply the preparation with some apparatus that will throw it on the vines in a very fine spray, and to get it in well on the underside of the leaves, walk along close to the row, holding the

nozzle pointing forwards and toward the vines and working it up and down to cover the whole face of the trellis.

After a heavy shower, it would be advisable to spray at once, as much of the solution will have been washed off. Remember, this is not a remedy but a preventative; if the spores have obtained a foothold, it will not kill them, but if they find the preparation when they alight they will die. So the growing leaves as they come out must be well coated, especially on the underside.

It is well to spray all varieties of grapes, but other standard kinds do not require it as much as those named. SECY.

FRUIT CROSSES AT THE IOWA EXPERIMENT STATION.—The bulletin, No. 32, just issued by the station contains a brief record by Profs. J. L. Budd and N. E. Hansen, of the progress being made in the experiment of crossing fruits and flowers, largely begun in 1892. It includes the Russian *rosa rugosa*, gooseberries, strawberries, grapes plums, pears and apples.

Of the *rosa rugosa*, which are crossed with pollen from the best garden roses, engravings are shown of two very double seedlings resulting from a cross with the General Jacqueminot. Many have not yet flowered. The gooseberries used in the experiment are wild plants from the Turtle Mt. region of Manitoba, fertilized with the Champion only last spring. The resulting seedlings are, therefore, only one year old. The purpose of the cross is hardier plants and freedom from mildew.

The experiments with strawberries are being made with crosses of the cultivated varieties with natives from Manitoba, combining brilliant color and remarkable fragrance.

In grapes the crosses are between cultivated varieties pollenized in some cases with the wild grape of Iowa.

The hybridizing of plums has been carried on at that station some eight years, and eleven promising crosses are described, in most of which (all but three) the Desota is one of the parents; the Rollings-stone and Wolf are named three times, Maquedota twice, the Speer three times and Japan plums as the male parent three times.

As to pears the crosses are of Mongolian Snow pear with the Kurskaya and Crassone Bergamot. The resulting trees are still too young to fruit, but many of them are promising.

Eighteen varieties of hybrid apples are described, in which Russian parentage figures largely. Only one has yet fruited, a cross of the Silken Leaf (female) and Osceola (male), which the report says "confirms the belief expressed in 1891, viz.: that hardness follows largely the mother variety, and that the fruit most frequently is modified by the male parent."

The results of these experiments will be looked for here with great interest, as they will be of nearly equal value to the people of this state. They at least point out the way.

NOTICE.

Summer Meeting,

1896

OF THE

Minnesota State Horticultural Society.

The annual midsummer meeting of the Minnesota State Horticultural Society will be held at the Experiment Station, St. Anthony Park, Minn., Friday, June 19th, 1896. A special invitation has been extended to the Commercial Clubs of the Twin Cities to be present on this occasion and has been accepted by them. A delegation, at least, will attend from each of these clubs, and it is hoped that a large number of their members, with the ladies, may join our society in this meeting.

The order of exercises will in general follow the usual course of the previous meetings which have been held at the station. This place is one of so much interest that the forenoon may well be devoted to an examination of the grounds and the infinite number and variety of experiments which are being carried on in horticulture, as well as in all other branches of agriculture, stock raising, etc. A number of valuable improvements have been made there since our last meeting in the way of erection of buildings and the laying out and general improvement of the grounds. Members and visitors are earnestly requested to be in attendance at an early hour in the forenoon, so that the interest taken in the tour of the grounds may not be cut short for lack of time.

The fruits, flowers and vegetables which form the exhibit on this occasion will be passed upon prior to the dinner hour. Lunch will be served at one o'clock and will consist of a basket picnic, to which, as usual, all who attend and desire to are invited to contribute.

Following the dinner hour will be the announcement of awards and a session of the society, which will be devoted largely to the consideration of forestry topics. Mr. D. R. McGinnis, secretary of the St. Paul Commercial Club, will present the subject of forest protection and submit resolutions in reference thereto. He will be followed by other officers and members of that club, who are much interested in this subject. Minneapolis will be represented by Hon. S. M. Owen, president of the State Forestry Association, and members of the Minneapolis Commercial Club. Capt. J. N. Cross, of Minneapolis, will submit to the meeting the further development of his for making these state trustee of plan used pine lands for the benefit of

MINNESOTA STATE HORTICULTURAL SOCIETY.

onal institutions. Others who are deeply interested in this will follow, and a general and full discussion will be had. a very important subject, and it is to be hoped that its con-on at this time may lead to some practical results. Secretary arrett, of the State Forestry Association, and other officers mbers of that body will be on hand to take part in the con-on of these topics, which are especially pertinent to the work of that society.

S. B. Green will take this opportunity to speak of what the is doing for forestry.

ttendance at this meeting is by no means confined to mem- invited guests, but the public and all interested in horticul- the subjects to be considered are earnestly invited to attend— all means bring the ladies with the purpose of spending the l having a good time.

is session is intended to be held at the height of the straw- eason, the same liberal premiums are offered as were given r, and it is hoped will draw out a very full exhibit.

HOW TO REACH THE GROUNDS.

rs from Minneapolis should take the Interurban electric car l get off at Cromwell avenue; those from St. Paul should e Hamline car and get off at Raymond avenue. Carriages at these points to carry visitors to the grounds at 9:30, 10:30 0 a. m. and at 1:30 p. m. As far as convenient, those attending lased to drive over in their own conveyances. Take Como from Minneapolis, and through Como Park from St. Paul. re ample accommodations on the grounds for stabling and for as many teams as may come.

rther information address

J. M. UNDERWOOD, President, Lake City.

LATHAM, Secretary, 207 Kasota block, Minneapolis.

PREMIUM LIST.

hibits must be entered with the secretary and in place by 12 M., to be en- ompete for premiums.

itors competing must be members of this society and the growers or f the articles exhibited. The fruits, flowers and vegetables exhibited e been grown in Minnesota and must be correctly labelled. miums will be awarded on unworthy exhibits.

	1st prem.	2d prem.	3d prem.
1 of cut roses, out door grown.....	\$4 00	\$3 00	\$2 00
" " " greenhouse "	3 00	2 00	1 00
of greenhouse flowers.....	3 00	2 00	1 00
annual flowers	2 00	1 00	.50
sign.....	5 00	3 00	

STRAWBERRIES.

lety exhibited, one quart.....1st prem., \$1.00; 2d prem., .75; 3d prem., .50

VEGETABLES.

as, three bunches.....	1st premium, \$1.00, 2d premium, \$	.50
"	" 1 00	.50
rs, six.....	" 1 00	.50
ix.....	" 1 00	.50
toes, ½ peck.....	" 1 00	.50
peck.....	" 1 00	.50
six.....	" 1 00	.50
, six.....	" 1 00	.50
six.....	" 1 00	.50

THE MINNESOTA HORTICULTURIST.

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JULY, 1896.

NO. 7.

Summer Meeting, 1896

A. W. LATHAM, SECY.

The annual midsummer meeting of the Minnesota State Horticultural Society was held as planned at the State Experiment Station, at St. Anthony Park, June 19. The weather was all that could be desired, if our friends could have had the making of it; the skies were bright, and a north breeze tempered the heat of the sun, so that the tour of the grounds, as well as the gathering in the drill hall, where the meeting was held, was in these respects highly favored. The number in attendance was very much of a surprise in that it exceeded so far any previous similar gathering. Over two hundred sat down at the tables to lunch, and until that stage of the proceedings there was no thought that so many were present, as a large number spent the forenoon in looking over the very interesting experiment fields, some on foot and others in the bus, which made several trips around the grounds.

Heretofore the gatherings there have been held in the grove, but fortunately, on account of the numbers, the drill hall had been selected for that purpose, and it proved none too large. The St. Paul and Minneapolis Commercial Clubs, as well as the members and other friends of the society, helped to swell the numbers.

The order of exercises for the meeting in the interests of forestry, which occupied the afternoon, was carried out substantially as had been planned, and proved to be an exceedingly earnest occasion. The speeches were short and entirely practical, showing the fidelity of our society to the most important cause of forest development and protection, which at this time occupies, in so large a degree, public attention in Minnesota. Important resolutions were adopted, and this society, with the forestry and other kindred associations, will undoubtedly take suitable steps to put into working form the purposes and plans presented at this meeting.

A great interest was manifested in the proposition of Capt. Cross to make the state trustee of the cut-over pine lands for the benefit of educational institutions, and though the details of this plan are not yet fully worked out we are assured that they will be in good season and will be presented to the legislature in a proper manner at the coming session.

A full stenographic report of the meeting follows, so that further reference to it need not be made at this point.

The exhibit of strawberries emphasized the rather unfavorable condition of the strawberry crop in our state this year, due to the dry weather of the year before and the absence of snow as a usual winter protection. Some twenty varieties, however, were shown and were of a good average quality. A fine exhibition of roses from the Jewell Nursery Co., Lake City, and several tasty floral designs and bouquets from various exhibitors were used to good effect in decorating the tables and added much to the beauty of the place.

On the whole, we feel that the meeting was one of the most satisfactory we have ever enjoyed, and that good has been done to a cause very near to our hearts.

Many men of note besides those who took part in the proceedings were present, among whom may be mentioned the names of Pres. Yanish, of the St. Paul Commercial Club, Dr. F. Schiffman, of St. Paul and P. H. Rahilly, of Lake City. A notable feature of the gathering was the large proportion of ladies present, who were interested and sympathetic listeners to the proceedings. The professors and their ladies at the farm school should be noticed in this connection, and especially Prof. S. B. Green and his active assistant, Mr. R. L. Mackintosh. The gatherings at this point entail very great labor and responsibilities upon them, which they always cheerfully assume, parting with us with urgent requests to come again next year.

AWARD OF PREMIUMS.

AT THE SUMMER MEETING OF 1896.

STRAWBERRIES.

Article.	Exhibitor.	Premium.	Amount.
Warfield...	A. H. Brackett, Long Lake.	Second.....	\$.75
Bubach.....	"	Second.....	.75
Bederwood.....	"	Second.....	.75
Lovett.....	"	First.....	1.00
Beverly.....	"	First.....	1.00
Crescent.....	"	Third.....	.50
Glendale.....	"	First.....	1.00
Childs.....	"	First.....	1.00
Van Deman.....	Jewell Nursery Co, Lake City.....	First.....	1.00
Haverland.....	"	Third.....	.50
Bubach.....	Wm. Danforth, Red Wing.....	First.....	1.00
Crescent.....	"	Second.....	.75
Monarch.....	"	First.....	1.00
Warfield.....	"	Third.....	.50
Parker Earle.....	"	First.....	1.00
Haverland.....	R. H. L. Jewett, Faribault.....	Second.....	.75
Smith's Seedling.....	"	First.....	1.00
Bederwood.....	Wm. Lyons, Minneapolis.....	Third.....	.50
Shuster's Gem.....	"	Second.....	.75
Lovett.....	"	Second.....	.75
Stamen's No. 1.....	"	First.....	1.00
Saunders.....	"	First.....	1.00
Woolverton.....	"	Second.....	.75
Crescent.....	R. H. L. Jewett, Faribault.....	First.....	1.00
Bederwood.....	W. L. Parker, Farmington.....	First.....	1.00
Warfield.....	"	First.....	1.00
Haverland.....	"	First.....	1.00

APPLES.

Seedling.....Ditus Day, Farmington	First.....	1.00
	M. M. Frisselle, } Judges.	
	J. S. Harris, }	

FLOWERS.

Floral design.....J. R. Cummins, Eden Prairie.....	Third.	2.00
Floral design.....E. Nagel, Minneapolis	First.....	5.00
Bouquet greenhouse flowers....E. Nagel, Minneapolis....	Second.....	2.00
Collection out-door roses...Jewell Nursery Co, Lake City..	First.....	4.00
Collection greenhouse roses.	..First.....	3.00
Bouquet greenhouse flowers	..First.....	3.00
Bouquet annual flowers.....	..First.	2.00
Floral design.....	..Second.	3.00
Bouquet annual flowers.....Wm. Lyons, Minneapolis.....	Second.....	1.00
	Alice Hazleton Green, Judge.	

VEGETABLES.

Asparagus, Purple Top	Wm. Mackintosh, Langdon....	Second.....	.50
Asparagus,Conover's Colossal	E. A. Ostergren, St. Paul...	First.....	1.00
Beets, Egyptian.....	"	....First.....	1.00
Cucumbers.....	"	....First.....	1.00
Beets, Bastion.....	Wm. Lyons, Minneapolis....	Second.....	.50
Turri-ps, White Strap Leaf...	"	..First.....	1.00
Lettuce, Black Seeded Simpson	"	....First.....	1.00
Radish, Scarlet Turnip.....	"	....First.....	1.00
Rhubarb, Linnaeus.....	"	....First	1.00
	J. T. Grimes, Judge.		

A SEEDLING APPLE.

Shown at the Summer Meeting of State Horticultural Society, St. Anthony Park,
June 19th, 1896.—J. S. Harris, Committee.

We find on exhibition at this meeting a variety of apples, believed to be a seedling, shown by Ditus Day, of Farmington, and produced by him in 1895, that is in good condition and of very fair appearance.

Description.—Size, medium; form, roundish, slightly angular, or five sided; pleasing appearance; color, greenish yellow, nearly covered with deep faintly striped red and many irregular grayish or russet dots over the surface; stem, medium long, rather stout, inserted in a narrow, medium deep, light russeted cavity; calyx, closed; basin, shallow, considerably wrinkled; core, medium, closed; flesh, fine grained, white, tender; flavor, mild subacid; season, winter; use, desert. The tree is of unknown origin, being a stump sprout ten or twelve years old from a tree purchased under the name of Saxton. The fruit on exhibition has been kept in a common cellar without special care up to the present date without showing decay. The tree was not injured during last winter, is free from blight and is carrying a good crop this season. A name for the variety has not been decided upon, and it will be known for the present as Ditus Day, No. 2.

**SUMMER MEETING OF THE MINNESOTA STATE
HORTICULTURAL SOCIETY,
1896.**

(Stenographer's Report.)

The meeting was called to order by the president, J. M. Underwood, at 2 o'clock P. M., on Friday, June 19, 1896.

President J. M. Underwood:—It is with great pleasure I meet you all here today, as our summer meetings are, in a great many respects, more enjoyable than our winter meetings. There are things we enjoy in the summer time which we do not have at our winter meetings. I find this day, particularly, a favorable and pleasant occasion for our society. We have an unusually large attendance today, and it is a repetition of what has always been our good fortune, to have a beautiful day. I do not know that we have ever had a summer meeting that it was not particularly pleasant, and this is no exception to the rule. Now, we have for our program the subject of forestry; I will say that we are to emphasize some of the features of forestry, some of the interests of forestry, and we have arranged our program along that line. I shall be pleased to call upon Mr. McGinnis to speak to us on forest protection for Minnesota, and hear some resolutions which he will offer, bearing upon that subject.

Mr. D. R. McGinnis, secretary of the St. Paul Commercial Club is introduced to the meeting.

ADDRESS OF D. R. M'GINNIS.

Mr. President, ladies and gentlemen of the Minnesota State Horticultural Society: It is a source of great pleasure and a matter of pride for me to have the honor of appearing before this assembly today, representing an interest which I consider of great importance to the state of Minnesota. I am in the deepest sympathy with the man who wrote that trees are "God's pillars." Not only from a sentimental standpoint need we look at this question of forest protection, but also from the standpoint of the practical man of the present age. But from a sentimental standpoint, from a standpoint of those who love beauty, I will say it before this assemblage, if it is not more pleasant, if life does not consist largely in the pleasure brought about by the tall kinds of grasses called trees—because a tree is only another variety of grass. Which would you prefer—is there one out of ten in this audience before me now that would prefer to live in an arid desert without a tree in sight to break the monotony, or would they prefer to live in a verdant land such as we look upon today? From the standpoint of enjoyment—and that is almost as much as there is in life—comfort and enjoyment and the

social amenities, does not the tree occupy a most important and prominent place? Does not the highest expression of modern civilization lie in the careful protection of the forests of any country? And Minnesota, with its much boasted civilization, will not have lived up to that highest standard until it puts into force an intelligent plan for perpetuating the forests over the surface of our fair state. I do not consider that we can boast that we have reached the highest point of civilization so long as we permit this deforestation to proceed that is so actively going on and take no measures to renew the forest growth.

I do not object to the proper use of the forests. God has created them, in His wisdom, for the use of man. Therefore, when a tree is mature, let man cut it down and apply it to his uses; but, it is equally important that that tree growth should be renewed. We do not object to the proper use of the forest. Let the lumberman cut and be welcome, because he occupies a prominent place in the economy of the state. The lumber which the great forests supply goes into our houses and makes our homes, and there are manifold uses for that same lumber. Therefore, we say, let the process of taking the forests, cutting off the timber on the land, proceed; but equally important is it to renew the forests as they are depleted.

I say to you, ladies and gentlemen, that this subject is especially important for the state of Minnesota. We occupy a latitude which gives us a cold continental climate. It is true that our climate is healthful; but would our winters be as pleasant if there were no forests to break the sweep of the winter winds?

This forest question embodies the prosperity of the agricultural interests of the state. It involves it very closely, because we know that where the tame grasses will grow, agriculture will bring the greatest results. In the forest sections of the state, we find the greatest agricultural prosperity; where the growth of the tame grasses is not successful, agriculture is not a success. The protection of the trees and maintenance of our forests will keep the the snow on the ground and maintain an even and abundant supply of moisture in the ground. In view of these facts, do you desire, is there one present under my voice who desires to see the forests taken off in this state? Would it not detract greatly from the beauty and comfort of our grand state to have them depleted?

Now, looking at this in a practical way, it is an especially fortunate matter that the state of Minnesota at this time possesses thousands, yea, hundreds of thousands of acres of land in the cut-over districts which have reverted to it for taxes, and which are now denuded, although once covered by grand forests. Who has not been impressed, when travelling on the railroads, by the barrenness of the burned districts? That land, fortunately, largely belongs to the state; and these resolutions, which I shall place before your society today for adoption, I hope, embody, to some degree, practical, civil and modern methods of forest management of handling this important question to the safety, comfort and prosperity of the state of Minnesota. Looking at this from a practical standpoint, is it best that this great pine interest, lumber interest, should die? It brings to us millions of dollars per year, gives durability to our

business interests, and makes prosperity with us. Is it best, I lay it before you, is it best that the pine lumber industry should die, should perish, and with it the advantages that are to be received from that source? No, gentlemen, no, let us preserve the forests, let the good work proceed; and let us lay intelligent plans and use our best efforts to perpetuate this supply of timber as one of the great resources of this state.

Therefore, with this idea in view, I have certain resolutions which I will submit to this society for its consideration. I will read the same, with your permission.

RESOLUTIONS.

WHEREAS, the best interests of the public demand that as important an industry as that of lumbering should be perpetuated, and,

WHEREAS, a proper percentage of forests exercises a most favorable influence upon the growth and prosperity of the country by checking the sweep of the winds, by maintaining an even and abundant supply of moisture in the ground thus tending to maintain the flow of our springs and rivers in even volume, and,

WHEREAS, it is especially desirable that in a cold climate like Minnesota a certain percentage of the forests covering this state should be maintained to prevent the drifting of snow in winter and drying out of the land in summer and to promote bodily comfort thereby and a supply of fuel in a state which, though rich in other resources, is destitute of coal measures, and,

WHEREAS, the experience of later civilization is that the public interest has made it necessary to reforest at an enormous expense lands previously denuded, and,

WHEREAS, the highest expression of civilization demands that no great resource of nature should be annihilated, therefore:

RESOLVED, that the Minnesota State Horticultural Society and the Minnesota Forestry Association favor the necessary use of our mature forest resources for the demands of trade and commerce and the reforesting of a proper percentage of our denuded forests in order that our forest resources may be maintained:

RESOLVED, that a non-political commission be created of persons experienced in forest management to make selection of such lands as are better suited to forestry than to agriculture, the title of which is to be continued forever in the state, and that such lands be maintained in a forested condition:

RESOLVED, that the Minnesota State Horticultural Society and the Minnesota Forestry Association endorse the act passed for the protection of the state from forest and prairie fires as a forward step in the intelligent management of the forest resources of the state:

RESOLVED, that a general committee of the Minnesota State Horticultural Society and the Minnesota Forestry Association and of other like organizations in the state and of the citizens of the state of Minnesota, be appointed to frame and promote the passage of a suitable forestry law to be presented to the next legislature of the state of Minnesota for the creation of a permanent forest domain, as an act suitable and appropriate to the present demands and conditions of the state:

RESOLVED, that the members of the Minnesota State Horticultural Society and the Minnesota Forestry Association pledge themselves to further by all possible means the object named in the foregoing resolutions.

Ladies and gentlemen of the society, these resolutions are placed before you for your consideration. I believe this to be one of the most important matters that can be taken up by the state of Minnesota for our prosperity, comfort and pleasure and to further all of the legitimate objects of comfortable living. I thank you kindly, ladies and gentlemen, for your attention.

A motion is made by Mr. Harris to unanimously adopt the resolutions read by Mr. McGinnis.

REMARKS BY J. S. HARRIS, LA CRESCENT.

Now, if we allow our country to become deforested, if we allow it to go on even at the rate it is going on now, the day when Minnesota can be praised for its delightful climate, for its beauty and productiveness in the grains, grasses and verdure, will have passed by. It will have become a land unfit for the habitation of civilized man.

I have been before you, ladies and gentlemen, as a worker in horticulture for forty years. I am a lover of trees—not so enthusiastic on the trees of the forest as trees bearing fruit. We cannot raise the trees bearing fruit unless we raise the trees of the forest to protect the fruit-bearing trees from the blasts of the cold north wind and the south and west winds. It is very important that every one should study into this matter and should put forth all of his influence and all the zeal he can stir up to have these resolutions put into force in this state. We can keep the reputation of Minnesota in no other way. And, although I have almost reached three score years and ten and may not have many days left, I pledge whatever days our good Heavenly Father will allot to me on the earth to work in this same good cause, not only to help the forests and maintain the reputation of our state, but to help develop in the interests of that state fruit-bearing trees which shall supply every man, women and child who comes within our borders with an abundance of our luscious fruits and with them the fragrant flowers.

President Underwood: It is moved and seconded that the resolutions read by Mr. McGinnis be adopted.

Ladies and gentlemen, we want to be liberal in our representation here today, and I wish you would all consider yourselves members of this society, the ladies as well as the gentlemen. That is one feature of our summer meetings that I appreciate very much, in that it brings out the ladies. In our gatherings in the winter time, there are only a few represented. Our society believes in recognizing the ladies equally with the gentlemen in our work, and we welcome to our ranks and membership all the women who may want to associate themselves with our work. There are a great many in the audience before me today who are not members of our society, strictly speaking, but you are members with us here today, and we shall be glad to hear from you all in the discussion of the topics that come before us and in voting upon the resolutions. You have heard the resolutions which have just been adopted, it will not be necessary for me to repeat them; they are now open for discussion by any one.

REMARKS BY C. L. SMITH, MINNEAPOLIS.

Ladies and gentlemen, I think that I drafted the first bill of any sort regarding this subject that has ever been introduced in the Minnesota legislature, and, in order to impress upon the minds of those here who are in favor of these resolutions some of the difficulties in the way of carrying them out, I think I may relate a little of the experience I had in regard to that matter.

A man was chairman of the forestry committee in the house that year who took considerable interest in the matter and who thought that it would be both practical and advisable to enact some such legislation, but the majority of the committee was against him and refused to report the bill to the house. The bill was also introduced in the senate, but the chairman of the forestry committee in the senate declared that legislation of that sort was unnecessary, that it was uncalled for, that the people did not ask for it, and that it was simply a scheme of some people in the state who had a lot of land that was worth nothing for any other purpose to unload it on the state for forest purposes. If I noticed properly the reading of these resolutions, there is one amendment that I think ought to be made, ought to go into these resolutions, in order to divert any argument of theirs; and that is, it is important that such lands as now belong to the state or may come into the possession of the state by sale for taxes (an explanation in regard to government lands and the way in which title is to be acquired would probably be in place here) should be set aside for forest purposes. I went before that committee to present some arguments, but found great difficulty in bringing this question up. Twenty-five years ago, there were bluff lands, lands that were stony and hill sides along the Minnesota and Mississippi rivers. They were covered with a fairly healthy growth of timber, trees varying in size from six to twenty inches in diameter. That land was secured as homestead or by pre-emption, and sometimes no title acquired to it at all, but the timber simply cut off—it wasn't worth anything for any other purpose. It was eventually sold for taxes. Fire ran over it, but in some instances it was protected, and in a few years there was a rank growth of young timber growing again. In one instance where I investigated, a man told me that in twenty years he cut thirty cords of oak wood off from an acre of such land. Now, that land in three or four years from the time the original owner first got title to it was advertised for taxes. It was sold for taxes. It came into the possession of the state; and twenty years afterwards a man acquired tax title to that land on payment of an average price of three dollars and fifty cents an acre, cut off thirty cords of wood per acre, and the land was sold for taxes the following season. He never paid any more taxes on it. That land now belongs to the state. And what is true of one particular tract is equally true of hundreds of acres of land along the Mississippi and Minnesota rivers. It will be true, in the future, of the thousands and thousands of acres of land that have been sold this year for taxes north of here. Thousands of acres of land were sold for taxes this year in counties north of us. On those acres of land is today a handsome growth of young timber, and if we shall

have no amendment to our regular laws on the regulations for reforestation and protection of these forests, in ten, fifteen or twenty years, this timber will either be stolen off, or the land will be sold for a nominal price, the timber cut, and the land revert again to the state for taxes.

Now, it is important that we should have some such legislation of this kind, but every argument will be brought to bear against it. For instance, one of the senators who was in the senate at the time I brought this bill forward said that this forest question was purely sentimental, that "the state has no more business to interfere with the raising of trees than it has to interfere with the raising of grain and potatoes; that is a matter for the individual, the state has nothing to do with it." Now, these various arguments are brought against any legislation of this kind on every occasion. Three times since has this matter been called to the attention of the committees of the house and senate who have charge of the forestry interests, and three times have they refused to report this matter. The forest fires, however, within the last few years, have attracted attention to this matter to such an extent that a more lively interest has been taken. We have now some remedial legislation in that direction; we appreciate it. But we have no time to waste; we should give this matter our immediate attention. The report of Commissioner Andrews has been favorably received by the press of the state. We should follow this up in our work, and give it immediate and strict attention. We should go to work now in our district, and ask every one, every voter to pledge himself, and ask every candidate for office to pledge himself in favor of passing such a bill before we give him our votes on election day, and follow it up after election and see that he keeps his promises. From now on until election day we should work for forest legislation and get elected to the legislature only such men as will pledge themselves to the passage of the bill! and not wait until after they have been elected, when they have no more favors to receive from us and consequently are not willing to grant us any. We must begin the campaign now and insist upon the nomination for the legislature of those who will agree to give this question at least reasonable consideration at the next session of the legislature. We want every acre of forest land that comes into the possession of the state to be reserved for forest purposes. That would not even go far enough. I, for one, would be heartily in favor, if necessary, of the amendment of the constitution of the state of Minnesota, so that it shall be impossible for any man to acquire, by tax title or any other means, an acre of the forest area of Minnesota that belongs now or shall hereafter belong to the state of Minnesota.

We have received from the general government—or we will go beyond that—the Creator has given us here in the state of Minnesota a land rich in forests, but we have been destroying it; we have not used it intelligently; we have not used it with any regard for those who are to occupy this state after we are gone. We ought to think of those citizens who shall live after us, of our children who will live after us, and give them a state, if possible, richer in forests than we received, rather than poorer.

The history of all the countries of Europe shows that deforestation has been followed by epidemics, pests and drouths and other calamities. We have the means within our power to prevent such things, and we ought to utilize them. This is an important question and well worthy our consideration, the consideration of every individual here. I hope these resolutions will be passed, not only passed but lived up to. It is an easy thing to pass resolutions; we must, by persistent and intelligent work in the caucuses, live up to those resolutions; get in our work before election, and then we will get our committee before the legislature next winter and get our bill passed.

Mr. P. H. Rahilly: Mr. President, I am not a member of your organization, but I would like, Mr. President, with your permission, to ask the gentleman who just preceded me a question, as I understood him to say he was the framer of a bill before our legislature and that the committee refused to report upon it. It seems to me that the duty of the framer of the bill was to offer the bill itself as a substitute in the house for the report of the committees. If the bill, as I understand, was never discussed before the respective houses—

C. L. Smith: If the gentleman will pardon me, I wish to inform him that I was not a member of the legislature, as he evidently inferred from what I said. I was simply acting as such committee man in the interests of forestry and framed the bill and gave it to a member of the legislature who was acting as chairman. I was not a member of the legislature, and I could not have done that.

Mr. Rahilly: I accept the gentleman's explanation. But somebody had to father the bill, as I understand it. Now, the duty of the gentleman who fathered the bill was to offer that bill as a substitute for the report. Then the bill could be discussed in open session, and an opportunity would then be given to know who favored it and who did not. If there was nothing of that kind, they would not know anything about the friends or enemies of the bill. That, it seems to me, is a matter of vital importance. It seems to me something should have been tacked onto the bill to have these men who have charge of it explain or defend their position.

President J. M. Underwood: Ladies and gentlemen, as I understand it, these resolutions contemplate appointing a committee who will take the matter in charge and frame a bill and present it at the next legislature without any mistakes, that we may succeed in carrying out the sentiments we are endorsing here today. Is there anything further to be said upon these resolutions?

J. O. Barrett: Before final action is taken upon these resolutions, would it not be well to have the plan as drawn up by Mr. Cross presented, which gives the method, or suggests one rather. Would it not be well to have that read before final action is taken on this? If you take action on these resolutions now, it rather precludes any action direct from the association.

President J. M. Underwood: Are there any other remarks upon the adoption of these resolutions? I do not understand that the adoption of these resolutions will, in any way, conflict with any work or any propositions coming from the forestry association, for, as I understand it, these resolutions recommend work in co-operation with them. That is the sentiment of the resolutions, as I understand them.

D. R. McGinnis: This is intended to embody general principles, not details.

Pres. J. M. Underwood: That is as I understand it.

The motion being put, the resolutions were unanimously adopted.

J. O. Barrett: It is suggested, Mr. Chairman, that a motion be made to this effect, that the executive committee of the horticultural society be authorized to select a committee from its society to act upon the plan, the bill to be drawn up, co-operating with the forestry association, which bill is to be presented to the legislature next winter.

Pres. J. M. Underwood: If I understand the motion of Mr. Barrett, it is that the executive committee of the state horticultural society appoint a committee for consultation with regard to the appointment of a committee to carry out the spirit of these resolutions.

C. L. Smith: Is not that matter covered in the resolutions, where it says that "this society act with the forestry association and kindred societies." I believe that the commercial bodies of the cities here, both Minneapolis and St. Paul, can be induced to appoint a committee to act with the horticultural and forestry associations, and I assure you that will give greater strength and prestige to the bill. I should be heartily in favor of having this committee authorized to act in conjunction with the forestry association and committees from these commercial and other bodies in this matter.

Pres. J. M. Underwood: If I understand the spirit of these resolutions correctly, it is that a committee be appointed,—a general committee of the state horticultural society, the

Minnesota forestry association and other kindred societies. It is simply leaving it in some way so that something can be done, some plan presented for the carrying out of the spirit of these resolutions. The resolution or motion of Mr. Barrett, that the executive committee of the horticultural society be authorized to select a committee from its society to act upon the plan or bill to be drawn up, co-operating with the forestry association is now before you.

The motion made by Mr. Barrett was seconded and unanimously carried.

Pres. Underwood: Ladies and gentlemen, we have with us today Mr. C. W. Horr, vice-president of the Commercial Club of St. Paul, whom I am pleased to call upon at this time to speak upon the subject of forestry.

REMARKS BY C. W. HORR.

Mr. President, ladies and gentlemen: I did not expect to be called upon to make any speech at this meeting. I want to present the regrets of Mr. Young. He was very sorry that he was called from the city on important business and could not be with us today; he also wished me to say that the horticultural society when in St. Paul should not fail to make the commercial club their headquarters.

One thought occurs to me about this question of trees. It has been commented upon by all foreigners who come here—that is all the foreigners who have made any investigation of the subject—they have commented upon the way we destroy our forests, and have said that in future years we will regret such destruction. I am glad you have taken up this matter in a systematic manner, and I want to say for the commercial club of St. Paul that we will do anything we can to further this end.

J. M. Underwood: I will say to many of you who are present today, that our society has very pleasant recollections of the hospitality and general good feelings manifested on the part of the commercial club of St. Paul towards our society. There are very many pleasant associations connected therewith.

J. O. Barrett: Mr. Chairman, lest I forget it, I will present a resolution in the midst of our debate.

RESOLVED, that it is very desirable that the Central Experiment Station collate the facts obtainable regarding the present condition and the rate of increase of growth on the cut-over timber lands of this state and have them in form to present to the next legislature to supplement the plan proposed by Captain J. N. Cross.

President J. M. Underwood: With your permission, we will call attention to this matter after Mr. Cross' plan has been presented.

Pursuing the question with regard to forestry, we have Mr. M. O. Nelson, correspondent of the "Northwestern Lumberman," of Chicago; and I would like to call upon him to say a few words on forest preservation from the standpoint of Minnesota lumbermen.

ADDRESS OF M. O. NELSON.

Mr. Chairman, members of the horticultural and forestry associations, I have been asked by the commercial club of Minneapolis to speak a word in behalf of the club to the members present today, and to express to them the faithful and substantial interest of the Minneapolis Commercial Club in the matter of forest preservation. I think those of you who are acquainted with the birth of the law that we have for the protection of our forests from fire know full well the action of the commercial club in Minneapolis in the passage of that law. I think, had it not been for the united action of the commercial club of Minneapolis and Major McGinnis, that law would have slipped into the waste paper basket of the legislature, even after all the stirring up our state had had from the forest fires of 1894. And you will always find in any practical plans for the preservation of the forests of Minnesota substantial friends and co-workers in the members of these two commercial clubs of Minneapolis and St. Paul, which represent perhaps twenty-five hundred of the strongest and best business men of the two cities.

I want to say something to you from the stand point of the lumbermen themselves. I am acquainted with, perhaps, the majority, certainly the majority of the leading lumbermen of the state, from my connection with them in a newspaper way. As Mrs. Partington has said, I believe, "there is as much difference in people as in any other class of men." I can say the same of lumbermen. There is just as much difference in lumbermen as in any other class of men. You will find a considerable portion among the lumbermen who will be enthusiastic battlers for any practical plan laid out by the forestry association for the preservation of the forest; others who will give a tacit consent to anything carried on; but there are lumbermen who are veritable bandits in the destruction of the forests, men who would burn the earth if they could do it. I have spoken with them within the last few days concerning some plans which the forestry association had in mind for the preservation of the forests of the state; and I find that the sentiment with regard to the question ranges all the way from a mild contempt to a real hopeful interest. I find some of them quite favorable towards any measure that may be taken for the preservation of the forests, and they have been very helpful thus far in carrying out the provisions of the law that provides for the extinguishing and the prevention of forest fires. I see here one of the posters which have been distributed in the lumber districts during the past year to be posted by the various counties for the prevention of forest fires. The lumbermen have been very active in the enforcement of these rules, and have given the help of their men all around to prevent fires in every way; and

they are in a position to do that more effectually than any one else almost. The danger from forest fires was made too manifest by the fires we had in '94, and there has been far less destruction from fire since the precautions were taken than before.

You will find that the lumbermen are quite favorably inclined toward giving the cut-over lands to the state. As you all know, the lumbermen are perfectly willing to give over to the state the greater part, perhaps all the lands, a very large portion of them at any rate, after they have gone over them; they do not much care after the timber has been cut off. They let them revert to the state for taxes by sections and whole townships at a time. They feel a good deal about it like a Wisconsin farmer, living in central Wisconsin, who once said to a friend of mine, "Mr. ———, what will you give me for this farm?" My friend said, "Why I don't care to buy it from you." "Just make me an offer." "I don't want your farm,—I don't want your farm." The farmer looked at him a minute, and said, "Well, Mr. ———, you don't want it, and I don't want it, and the devil don't want it. I believe I will give it to the state of Wisconsin." That is about the way the lumbermen feel concerning a good deal of this land that is cut over. So, that as far as that question is concerned you will find them all in favor of any practical plan in that direction.

There are some other suggestions I should like to make. One is, the clearing away the debris in the woods. Now, mention that to the lumbermen, and they will tell you it cannot be done in the next fifty years, not until lumber is very much higher and labor very much cheaper can it be done. They say that could it be as far as the expense was concerned, it is almost an impossible thing to do without endangering the standing timber. The only time it could be done would be when it is very green or when it is rain-soaked; that would be the only time it could be burned, and every one knows what it is to burn green pine or wet wood. It is almost an impossible thing to do this. Then, the expense of clearing away the debris would be so great as to banish any thought of it being done. It would cost, they say, more to clean up the tops of the trees than to get the logs out. All know, perhaps, about what it costs to get logs out, and with the added expense, four or five dollars a thousand, such a thing would be altogether impossible, at the present time at least.

There is another thing which should be done, and which should be taken into consideration. The lumbermen all admit that the lumber is cut too close. Timber six inches in diameter ought not to be cut. There are hundreds and thousands of logs in the saw-mills of Minneapolis, that will hardly cut into a 2x4. That kind of logging is destructive, is killing off our forests, and the lumbermen would be only too glad to stop it. But you ask them why they do it, and they will tell you for this reason, that their timber lands are taxed so high, and even their cut-over lands are taxed so high, that the only thing for them to do is to cut off the timber as quickly as possible, sweep the land as clean as possible, and then have the land go back to the state, so they will have to pay no more taxes upon it. They have suggested that if the taxes on the cut-over

lands could be reduced to a mere nominal sum and the taxes upon the standing timber be somewhat reduced from what it is now, the lumbermen would not destroy this young timber. I think every one is willing to admit, that some of the counties in our state are laying altogether too heavy a tax on the standing timber and cut-over lands. In Aitkin county, for instance, they have a magnificent park built out of the taxes on non-resident lumbermen; and the aim of the inhabitants of these thickly wooded counties is to get all the money possible out of these lumber barons, to rob them of as much as they can, for the building up of the interests of the county, such as the building of schoolhouses, court-houses and public buildings of that sort and the paying of salaries altogether unnecessary. The lumbermen say that if these taxes were cut down to a nominal sum, they would leave a great deal of the small timber to grow. A six-inch tree, in fifteen years, would be worth five times as much as to-day.

These two points, the preservation of the forests from unnecessary fires and the lowering of taxes to permit this small timber to remain, are the points that the lumbermen think practical. And these I have endeavored to present to you from their standpoint. You will find that nearly all the lumbermen, so long as you appeal to their self-interest and do not go too much on the benevolent idea, are ready to be practical battlers for any practical schemes the association may lay out for the preservation of the forests in the state of Minnesota.

I thank you for your attention.

Pres. Underwood: Ladies and gentlemen, I think it has been generally supposed that these commercial clubs were organized chiefly along social lines and for social purposes; but I assure you that our society has found them to be composed of men who are ever ready and willing to work in the interest of all good causes in our state and are prominent in furthering all important subjects that are necessary and prominent in the growth and development of our state, and that the Minneapolis Commercial Club has been no less active in its work along these lines. Now, I wish to call upon Capt. Cross, who is a gentleman working in another line of thought and business from what we are, but who has found time to give this matter of forestry and the protection of our forest interests very careful consideration, and who has a very practical plan to propose along this line. I would like to have him step forward and tell us of his plan at this time.

ADDRESS BY CAPT. J. N. CROSS, OF MINNEAPOLIS.

Mr. President, ladies and gentlemen: I am not a practical forester, but I was brought up in the woods of northern New York—the woods of fifty years ago or more. It was while I was listening to a conversation between the president and the regents of this institu-

tion that has given us this splendid outlook and work we see before us here, something over a year ago, after the great fires, that I thought out a little scheme for the acquiring by the state of Minnesota the beginning of a forest area without taxing the farmers in the rural districts. In the first place, it would not do to ask the people of the state of Minnesota to issue bonds or tax themselves to buy the beginning of a forest area. Too many of the people in this generation have been engaged in cutting down the forests in order to make themselves farms on which to earn their living. It would not do, perhaps, to divert the forests that are owned by the state for certain purposes from the purposes for which they were dedicated to the state, such as school lands and others, for state forest area. It would not do, for the state has been made trustee of these lands for some specific purpose. The question of taxing land came up in my mind. There is not a state in the Union I know of, that has made a permanent ownership of lands, title to which it acquired by tax sale. If such is the case, I have failed to observe it. It is possible it might be brought about, that lands which have been sold for taxes might be diverted in the direction of a permanent forest area; but the same questions would be involved in regard to land acquired by the state by tax title as in the case of an individual. The same difficulties would have to be contended with. We all know that no one likes to put up a permanent improvement upon lands acquired by tax title for the state to sell. It would be a good deal like taking away the property of the individual for the benefit of the state at large. And, therefore, I thought to myself that it might be possible that an appeal might be made to the wealthy pine owners of the state to give part of their lands, that part which could not be used for agricultural purposes, to the state for forest area. If we could make it an incentive to the lumbermen to donate such land for that purpose, that could perhaps be done. And for that purpose I drafted a paper, which is only two or three pages long, with that idea in view. It will only take a few minutes to read it. The substance of this was gone over in a conversation with Governor Pillsbury. I communicated my plan to him, and it brought to his remembrance the pot of money he made, when a boy back in New Hampshire, from buying cut-over lands. I will read this with your permission. This paper was addressed to the lumbermen of the state.

PAPER BY J. N. CROSS.

MINNEAPOLIS, MINN., Dec., 24, 1895.

To the Owners of Large Areas of Pine Lands in Minnesota:

GENTLEMEN:—In view of the awakening regarding the preservation of our forests, I desire to submit for your consideration a suggestion in the line of preserving, as far as possible, our forest areas, while benefiting both the state and the owners of pine holdings.

I am informed that in Maine and in certain mountainous districts of the East, where lands are kept only for growing timber, that the same are cut over clean about three times a century, or once each generation. Individuals would not feel like paying taxes for that length of time in order to reap a harvest of timber thrice only in a

century. Many holders of wild lands, after the pine has been cut off, especially where the land is very rough, very sandy or very rocky and mostly unfit for farm lands and has no minerals, would be glad to devote such lands to the growing of timber again were it not for the burden of taxes and the compound interest on the same for a third of a century.

What I desire to suggest is, that a sufficient number of the larger holders of pine lands in Minnesota meet and discuss the feasibility of appointing a committee to ascertain facts, consult the best authorities on forestry and to consider the legal and political questions involved, as well as the difficulties in the way of maintaining forest areas in regions of country interspersed with rich farming areas; all inquiries to be prosecuted with a view of making an offer to the state through the governor in time so he too may well consider the offer, to be by him submitted to the legislature with his recommendations, on the following lines, to-wit:

First:—Any person so desiring may deed any such lands or other lands to the state for the purpose of growing forests, when such lands have been examined and recommended to be received by the state as a part of its "Reserved Forest Area." Such examination and recommendation to be made by the town or county forestry commissioners, as may be provided by the legislature. For economy the regular county commissioners could be constituted the county forestry commissioners, and the town supervisors could be constituted the town forestry commissioners, the county and town forestry commissioners to be advised and instructed by a state forestry board, if one shall be constituted, otherwise by the state land commissioner, who is the state forestry commissioner. A proper record would of course be provided, and certificates given to grantors as evidence for use of beneficiaries.

Second:—Such lands becoming the lands of the state for public benefit, for the health of the people, for preserving the water courses and water bodies of the state and such humidity of atmosphere as we now possess, of course would be exempt from taxation. Even if the title were held by the donors for public use, as in the case of highways and public grounds, still it would be legal to exempt them from taxes because dedicated to public use.

Third:—It could not be expected that private persons would donate large estates to the public without compensation. The state could not undertake to pay a direct price, but could undertake to make compensation in the following manner, greatly to the advantage of the state and its people, including its future finances, as well as to many of its struggling colleges and schools, and, finally, greatly to the interest and advantage of the grantor: that is, in the future vast revenues would accrue from the public forest lands. These revenues, I would have divided something as follows:

1st:—One-third to go to the state to reimburse it for outlay in protection from fires, re-planting or re-seeding and generally for care and management; a portion of this third should go to the towns and counties where located to reimburse them for public improvements made, such as roads, etc., which the forest reserves would not be taxed for directly.

2nd:—One-third to go to the grantor or to his heirs or devisees for the first hundred years, after that to the school or college which he may name to receive the third one-third (this because of the difficulty of the state keeping track of the grantor's heirs or devisees and their heirs after one hundred years—and even that may be too long a time to provide for).

3rd:—The other third to go to such school, academy or college, denominational, private or otherwise, as the grantor may designate either at the time of granting the land to the state or by his will or by an instrument executed in the manner of a deed and recorded in the county where the land is situated. In case of the failure of such school, academy or college to exist, or in case of the grantor's failing to designate such school, academy or college as beneficiary of this last one-third of the income, then the same to go three-fourths to the public schools of the state and one-fourth to the state university.

4th:—There would be many details, of course, in such a system to be provided for by legislation from time to time, as exigencies arose. The inhabitants near large forest tracts would not like to build roads, bridges and other improvements with untaxable areas in their midst; roads would have to be cut through the state forests; many farmers would want to cut the dead and down timber and possibly might trespass on the live timber, some would want to rent for pasture, use low places for meadows, cultivate places barren of trees; town sites might need to be laid out on portions; and many questions would arise of a semi-public policy nature, which must be solved as time and the people only could solve them. Some tracts might have to be given up to culture in the future; in such cases the state would have to deed them; but in every such case the proceeds should be divided as arranged by general law at the inception of the plan.

Gentlemen:—The plan above outlined is wholly in the rough, and only presented for discussion. If worth considering as an outline, a committee will be expected to work out the perfected plan, to be presented to the state. I believe that no better investment can be made by those having large areas of unsalable cut-over pine lands than by thus placing the title in the state. The grantor accomplishes two most desirable objects: first, a safe, permanent future investment for his estate; second, he places to the credit of a favorite denominational school or college a future income. Besides these private objects, he becomes a public benefactor. He who shall place his name in the recorded lists of contributors to a state forestry area may be sure that future generations will hold it in grateful remembrance.

Now, this plan was outlined only in the rough. It is worth considering that a committee was appointed by the lumbermen to to whom I addressed this paper; they put upon that committee, Mr. Beals, who is here present, and who has charge of the weather service of this state; and Mr. Ayres, who is a practical woodsman. They were invited to hear the discussion on the part of the forestry association. Governor Pillsbury was kind enough to

go before the forestry association and say to them what he thought of this, and I am sure he is in hearty accord with everything this association and the forestry association will do in a practical way to preserve the forests of this state; and especially those forest areas that cannot be used for agricultural purposes. It cannot be expected that where the land can be used for agriculture, it should be retained for forest purposes. But there is lots of land that cannot be used for agriculture, sandy, rocky land, which could be turned over to the state for permanent forest area.

I see both General Andrews and Governor Pillsbury here today. They probably have some information in their own mind, some criticism or objection to this plan.

Pres. Underwood: This is a very practical and interesting presentation of the subject. I would be glad to hear from Governor Pillsbury, General Andrews and Mr. Beals. Will Governor Pillsbury say something to us on this subject?

REMARKS BY EX-GOV. J. S. PILLSBURY, MINNEAPOLIS.

Mr. President, ladies and gentlemen: I did not expect to be called upon to make a speech or anything of that kind, but as the matter has come up, I will take occasion to say that I have had a talk with Captain Cross in regard to his plan for coming at the details. You may make out all the resolutions you please and have them passed, but when you want to accomplish your object you have got to get at the details, you must have some manner of arriving at objects you want to accomplish. Now, Captain Cross has a paper there that is pretty good, it will reach a certain class of people, the people who hold the largest portions of the poor lands in the state, and that is the lumbermen. There has been a great deal said here this afternoon about cutting off timber, slashing, murdering, etc. Now, gentlemen, why have they done it? It is because they came into this country here for the purpose of making some money. They bought up these pine lands, paid the government its price for them; they are now their property. Now, what these gentlemen have done is to go onto those lands and cut the timber off their own land. Is that right or is it wrong? The state, you may say, is to blame for this destruction of the young timber, of six-inch timber, as this gentleman has told us about. But when a man has bought a hundred and sixty acre tract of land, pretty well timbered, with \$1,500 worth of timber on it, he will go on to that land and cut off his timber and no man in this state or anywhere else can prevent him. He has bought that property, and it is his. So much for that.

One great trouble about these cut-over lands is the high prices. I can speak from experience, and pretty broad experience at that. In those counties where land has been cut over, the law provides that the assessor shall go onto the ground, go onto the land—in the city, on each lot, in the country, on each forty acres—and he shall appraise the land whatever he thinks it is worth, forty or fifty per cent. of its actual value. Now, instead of doing the duties of the assessor, in these counties he sits in his office and never goes onto those lands at all and assesses them at \$5 an acre, at \$10 an acre,

whatever it happens to be. Some provisions ought to be made in this state to compel the assessors to do their full duty, and in that way the land would not be taxed at the same rate whether timbered or cut-over land. Now, in the state of Minnesota there are over a million acres of stumpage. The principal value of these lands is in the stumpage. When the timber is cut off the land, the land is of no particular value—and the state of Minnesota should see that the assessor does his duty. So much for that; that is all I want to say on that subject.

Now, the thought had occurred to me, we have a large amount of pine lands, cut-over lands, and their value when cut-over is reduced from whatever value these lands have when the timber is on them to about seventy-five cents or a dollar and a quarter per acre, unless there is some hardwood timber on the land. Now, these gentlemen dislike to pay these taxes, because the assessment of \$10 per acre keeps right on, regardless of the fact that the timber is cut off, and to use a common expression, that is little better than taking a man's money and giving him no returns. Now, these gentlemen have become so disgusted, that many of them have rather abandoned the land after the timber has been cut off, have abandoned the lands from the fact that the prices were so high the lands were not worth paying such high taxes on. Sometime the taxes would run as high as \$1.

Now, if these things could be adjusted in some way, the holders of these lands would, most of them, be glad to donate them for some such purpose—if it could be put in some way so that in the future, in the long distant future, they or their heirs might receive some benefit. Now, Captain Cross's idea was, with a certain class, that a man might give lands to the state, and after a time a certain portion of it would go to some educational institution and a certain portion of it to the state, a certain portion of it to towns, etc. That is a very good idea. Now, so far as the lands owned by the lumbermen and where the timber has been cut off are concerned, I have no doubt that if a law were passed something after the principles embodied in this plan of Captain Cross, that a large, a very large amount of the cut-over lands in the state of Minnesota would be placed under the provisions of this law; but you want that made into a law, so that when a man comes and says, "I have got a thousand acres of land I want to place in the hands of the state and which I want to donate for the benefit of this institution, Hamline or MacAllister or any of those colleges, he will derive some benefit from it in his own way. I have no doubt that a large amount of those lands would be donated for this object. I just want to illustrate. When Dartmouth College was established in 1767, somewhere thereabouts, a hundred years ago, the state of New Hampshire had a large amount of land that was located among the mountains which was of very little value, and they donated it to this institution—it was a denominational institution, but it has answered well for a university for the state of New Hampshire—and when the state gave it these lands, the state did not call them good for much; they were considered of no practical value. There were also individuals who had a large quantity of lands, and they were friendly to the establishment of

this educational institution, and they contributed their lands. These lands were in the northern part of the state, up among the hills and the mountains, the White Mountains. These lands were chiefly timbered lands but, of course, of no value. Well, it run along and run along, and that part of them which had been contributed by the state of course was not subject to taxation, but the land given by individuals, the deed having passed from the government to the individual, of course was subject to taxation. It ran along for seventy-five years, and all at once a small railroad was built up into that section of the country—and now they have even gone so far as to build a railroad on top of the White Mountains—and the land through there that for so many years was worthless has become and is worth millions of dollars, and Dartmouth College has derived the benefit of some three or four hundred thousand dollars worth of land which the state gave them. On most of the lands that individuals gave them, taxes were assessed, and after twenty or twenty-five years they lost the title. Now, any one who wishes to provide for the future of an institution, this would be the way to do it. This would be the way to endow a college. I have no doubt the lumbermen would all be willing to contribute these lands for an object about which they would have a little something to say in the future.

There is another—I don't know but what I have taken up a little too much time, but I would like to relate an instance in my early life. Before I came out to this country, in 1853, my brother and I bought a piece of timber in the town of Hookset(?), New Hampshire, and there weren't many railroads there at that time. The timber had been cut off this land twenty years before, or fifteen years before, and the man had received a very large sum of money for the timber cut off the land. He sold the land for a small price. We got a very large amount of pine timber cut off from that land, which we sold for masts and keels for building vessels and the like, and we got a good deal more from that land than the man who sold the timber off from it originally. That shows what can be done with cut-over lands when the timber is left growing for a few years. That was only fifteen or twenty years before. So much for that.

After the land has been cut over, if only the timber could be preserved and put entirely into the hands of the warden and have it protected, in seventy-five or fifty years this land, this cut-over land, would be worth millions. Our country out here is settling up fast, with five hundred thousand coming in from foreign countries besides the increase of our own population, and ten years from today there won't be any government land in this state to be had; so that within fifteen years from this day these lands, all these lands, who can tell but what they will be worth a fortune?—from fifty to seventy to one hundred years, I have no doubt of it at all.

I am very glad to see this matter taken up, and I heartily approve of Captain Cross' plan, because I am somewhat interested myself, and if some such bill is passed, I shall give my share to the university, and let it have the proceeds.

I thank you for your attention.

J. M. Underwood: We shall be pleased to hear from General Andrews on this subject.

REMARKS BY GEN'L C. C. ANDREWS, STATE FIRE WARDEN.

Mr. President, ladies and gentlemen: I did not come prepared to make any speech, and I will not occupy much time. I have been listening to these people, and of course have enjoyed this discussion very much, and am heartily in accord with the resolutions and plans brought up here and endorsed by this very organization. I am glad to meet with so many intelligent people from the different parts of the state and believe the endorsement of these projects by this association is of great value. I believe these lands would prove very valuable state lands, and if this agitation is kept up, I presume the result will be the adoption of some legislative measure.

There are one or two ideas I would like you to bear in mind. Every one of you, I suppose, is a lover of the forests, a lover of the pine woods, and every one knows that it is a great sanitary factor. People go to the Southern states in order to spend some months of recreation in the pine woods of the South; they also go to the pine woods of Minnesota, as especially the pine woods are very favorable summer resorts and noted as great health resorts.

Now, some of you, no doubt, have seen something of the virgin forests of Minnesota, know something of the forests we have had up in the Lake Superior region, in Pine county and neighboring counties, all the way from Rush City up to Lake Superior. Now there is hardly a tree to be seen. But this idea which I wish to impress upon you—it will only take a few minutes—is that we have in the vicinity of Minneapolis, on the shore of a lake, timber of great importance, grand pines, but which will be very rare in a very few years. Then up here in Carlton county, in our own state, is a remnant of the original pine forests which would make a fine health resort if preserved, but they are cutting them off very fast. Then, there is Red Lake, you know, that is a very extensive and a very grand forest. There is—as I have stated in my report—there is a most magnificent forest, which could be acquired without any trouble—I have reference to the forest of Red Lake. That should be obtained, the merchantable timber sold off, the rest reserved to be kept as a perpetual forest area. Now, every one here is interested in having one or two of the virgin forests of Minnesota held in its primeval state, and the grand trees, that have been there for two hundred years or more, three feet in diameter and a hundred feet high, preserved. Such a magnificent forest would make a fine health resort. It would draw a great many visitors to this state. It would be of great value to our own people. I am glad that so great an interest has been taken in this matter, and the preservation of the forests will add something of beauty, of health, of comfort and pride to the state.

I thank you.

President J. M. Underwood: Ladies and gentlemen: in carrying out the details in this important work, you will accomplish something of interest, something of value to the state.

In the development of our horticultural interests, we have found a great deal to combat and many important duties that we have had to take up and carry out, so that if there are any details in the carrying out of this forest preservation that need to be looked after, I hope the lessons we have had in the past will not have unfitted us for taking them up and carrying them to their proper termination. I would like to ask Mr. Beals, who is present here, to present some resolutions bearing upon the subject. Resolutions do not amount to anything, as has been said, unless the spirit of the resolutions is carried out; but he has something prepared upon this proposition of Captain Cross, and we should like to hear from him.

E. A. Beals: Mr. President, ladies and gentlemen: I must say Mr. President, that you have been misinformed in regard to my having any resolutions. I came here to listen to the discussion, and have no resolutions drafted to present here. But I would state that this is a subject of vast importance to the people of Minnesota. General Andrews has spoken to you of the importance in a sanitary way, I can state that it is equally important from an agricultural standpoint. As the members of the horticultural society have not yet been heard from, I should like to hear some practical ideas from them on the subject.

I thank you.

President J. M. Underwood: Ladies and gentlemen: if I was mistaken on the matter, it is probably owing to the large amount of dinner I have just partaken of. However, of course, we cannot prolong the discussion of this subject too far. As I understand it, there is to be a committee appointed, and that committee, when appointed, will no doubt take this up, discuss the proposition that has been presented here today in the interest of forestry along the lines Captain Cross has been so thoughtful to prepare, and they will look after the details and results we are after. We would like to spend a great deal of time here, much more time. We would like to call upon many of the gentlemen who have not spoken, but the hours are passing, and we must hurry along with our program. Mr. Latham has a letter or two he wishes to read.

My attention has been called to the resolution presented by Mr. J. O. Barrett, as follows:

RESOLVED, it is very desirable that the Central Experiment Station collate the facts obtainable regarding the present condition and the rate of increase of growth on the cut-over timber lands of this state and have them in form to present to the next legislature to supplement the plan proposed by Captain J. S. Cross.

A motion was made and seconded to adopt Mr. Barrett's resolution, which motion was unanimously carried.

Secretary A. W. Latham: I have a letter from Col. Stevens I would like to read from.

"Owing to illness I shall be unable to attend the annual summer meeting, Friday next, but I am very anxious to have Mr. Cross' proposition endorsed by the society in regard to forestry. I trust you will have a profitable meeting, and only regret I can not be present, it being the first I have missed in many years."

I have also a word from Mrs. Ida E. Tilson:

WEST SALEM, Wis., June 16, 1896.

"I regret I cannot be at the gathering June 19, but send my kindest greetings to all."

REMARKS BY SECY J. O. BARRETT.

Allow me just to say a word. I was requested by our forest regent, after this committee was appointed, to send an abridged circular of the plan by Mr. Cross to the editors of the state, to all the members of the last session of the legislature and to the different states. I did send the circulars,—we published a supplemental edition, as it is called. I had a call the other day from a committee—I suppose appointed by congress to devise a plan by which the forests under national domain could be protected—asking for that circular (I may be mistaken as to the authority, but I supposed it was the national committee). I sent it to these gentlemen, all scholarly men. I have a paper from a Boston editor called "Northeastern Lumberman." I sent a letter to the editor asking for criticism. He published a very gentlemanly criticism and wrote a very encouraging letter. I want to lay these documents before you. I have received answers from all around, even from California and Massachusetts, as well as our own state. Let me add right here, that the eyes of the people of the United States interested in forestry are fixed upon Minnesota. They regard Minnesota today as the leading state on a practical plan of forest protection; and they want to see the sequel, anticipating something that will be really the thing they need, when we arrive at the finality of our bill acted upon by the legislature. I will state for the committee here, that I think that the theory or the plan devised by Captain Cross is not a complete one; it is only presented to the public to attract attention. And you have come here, like one of the actors, to give your opinions and to discuss matters. As a committee has been planned to be appointed by the executive board of this society, doubtless from kindred societies, from the lumbermen's association and, I hope, from the commercial clubs and the health board and from all who are allied with the forest interests, I hope all of these will be identified in the bill which we shall eventually present to our legislature. I believe the time is ripe for action. There is no doubt about it. And we have brains enough in Minnesota to

devise a plan acceptable to all classes, of lumbermen especially when it comes to a finality, and then you will see Minnesota will be up and dressed before breakfast.

I thank you.

Pres. J. M. Underwood: This subject is open for discussion, and we shall be glad to hear from any one who has a thought to offer upon the subject. We have with us today a gentleman who is, no doubt, interested in this forest question. A gentleman interested in the educational interests of our states, and who is suffering, no doubt, from the lack of a proper amount of trees on our prairies. I do not know, however, that we can enter into the interest of this question as an educational feature of our state, but if Prof. Pendergast has a word to say, we shall be pleased to hear it.

REMARKS BY PROF. W. W. PENDERGAST.

Mr. President, I did not realize for a long time what you were trying to get at. In the first part of this meeting I was in hopes that no one would see me, but after this bill, these resolutions, were read, I was rather in hopes you would, for I wanted to say a few words on the subject. It will not do to say that Minnesota must preserve all of her state lands, all the timber lands and keep them out of the market. It is of vast importance that we should have a forest reservation, but this little boy and that little girl over there, and that older one, and that one there, are not to pay all of these bills. It has been suggested here that the state should never sell any of her bad lands, but save them all for a forest park. There is some other way to do this—there must be some other way. Every sixteenth and thirty-sixth section in this state must be saved for the boys and girls growing up. If there is something different, something that has a prospect of turning out well, something that promises results, I am heartily in favor of it; and it seems to me that if the lumbermen in this state, who cut off timber on thousands and millions of acres of land, are willing to let the land go back to the state, if they are willing to do something of this kind, the state should be ready to meet them in a proper spirit, and accept the lands and do just about what has been suggested here, if that will be acceptable to them.

Now, a great deal of stress has been laid upon the influence of trees on the climate, of pine trees upon the climate. That is all very true, no doubt. I have not had as great an experience with the pine as a source of warmth as I have had with the birch. I can tell you something of the warmth there is in the birch; it is really affecting. Take one four feet in height, and it is enough to keep one warm for a long time; I have known the warmth of such a one many and many a time. I think that we ought to have the tall pine. But I must get through—only a minute more, it will only take a minute—it seems to me just as soon as we can get hold of something really practical, something that is specific, something that

promises something, that will yield the results we have been looking for, and something that we can lay hold of, then we ought to seize that and make the most of it. Now, I have seen nothing or heard nothing that promises better than the plan of my old friend, Capt. Cross, and if there is anything in it, why, we will adopt that; but let's see first what can be done with what he has suggested. I am really in hopes that the committee to be appointed will report that there is something in the future for us in the way he has suggested or outlined. And what Mr. Barrett said about the effect, the influence those circulars he sent out has had, in that so many enquiries have come in from all over, makes me feel that there are good prospects ahead of something being done. These general resolutions that aim at nothing in particular are very much like the man who stood anywhere hitting at nothing and always hitting the mark.

I thank you.

Mr. H. B. Ayres being called for, said:

Mr. Ayres: Mr. President, ladies and gentlemen: I would like to express the feeling that I have never attended a meeting in which, it seems to me, there was so much promise. I am in the woods all the time, and in the remarks made today there has been nothing that seems discordant with the sensible and practical in the conditions that we find in the woods. It seems to me we are drawing attention to this subject, and that is the most important thing for us to do. The people of Minnesota are a sensible people, they are a practical people, and if they only give their attention to the subject and keep on giving attention to it until there is some effect, something will be done. I have never been so hopeful as I am now at this meeting.

I thank you.

R. S. Mackintosh: Mr. President, ladies and gentlemen, I would like to present this resolution:

RESOLVED, that this society heartily endorses the purposes of the plan proposed by Capt. J. N. Cross in regard to the state acquiring the cut-over lands, and urge the consummation of the same by the passage of suitable legislation.

J. O. Barrett: Mr. Chairman, I do not know as I understand this correctly. Capt. Cross' plan is not presented as a finality, but as a consideration for future action. I would not like to have this society commit itself positively, as far as I am concerned, on that plan, because there are chances to simplify it and to modify it by some future committee or committees before the bill is sent to the legislature. I object, as far as I am concerned, to the passage of the resolution on that ground.

J. N. Cross: This plan is not brought for any final action; if something better can be furnished, or any amendment made, no one would cut it in two with a knife sooner than I.

A. W. Latham: Mr. President, it seems to me there is nothing in Mr. Mackintosh's resolution and in what we have been

doing here this afternoon but what is general in its nature. Capt. Cross has made an outline of a plan for the work in a general way. I would like to express my sentiments on this subject by assisting in the passage of this resolution.

President J. M. Underwood: As I understand it, this resolution offered by Capt. Cross was simply introduced as a good thing and for general endorsement; the adoption of it would simply be the expression of this society in favor of the general outline proposed by Mr. Cross. I do not see that there can be anything particularly out of the way in acknowledging the efforts he has made in bringing the subject to our attention. I do not think Mr. Barrett quite comprehended the full intent of those resolutions.

D. R. McGinnis: It appears to me that the plan submitted by Mr. Cross is highly practical, and of course that is what we are trying to get at. I would suggest that his plan be favorably recommended to this committee that is to be appointed to draft a general plan.

Pres. J. M. Underwood: That is the purport of this resolution, if the wording is not just exactly what we want. We heartily endorse this—that is, the idea of Capt. Cross' proposition.

A motion was made and seconded to adopt Mr. Mackintosh's resolution, which motion was unanimously carried.

President J. M. Underwood: We would like to hear from Prof. Green for a few moments, as the closing feature of our meeting here under these very pleasant and favorable surroundings today. This is our home, it is true; we come here to partake of our own bounties, the provisions that we have taken the foresight to provide here, and we have able representatives here who are always active and cordial in their greeting to us on occasions of this kind. And I would like a few words, before we close our afternoon and our summer meeting here, from Prof. Green. And then, as the hour is getting late for us to hold our session, and many want to go home, we will probably have to close our program.

REMARKS BY PROF. S. B. GREEN.

Mr. President, ladies and gentlemen: We are very glad, indeed, to have you with us here today, and especially to have had you discuss the subject of forestry in all the practical bearings which that subject has now assumed in this state. It is a line of work with which every member of the state staff here is heartily in sympathy. They believe it is an important work for the state to do something towards showing what can be done with these cut-over lands in this state. It is a very important problem which is presented to us at

this time. The experiment station here expects in the near future to make some experiments and determinations along that line. It is the legitimate work of the station. We have, for a number of years, experimented in the planting of trees on the prairies; that is the line along which the forest investigation and study has been conducted in this state practically up to the present time, because that is what the settlers needed, windbreak and timber supply. We have done considerable experimenting along these lines. We have experimented in the southwestern counties, where we have put out quite a large quantity and a very large variety of timber trees to see what they would do upon that peculiar dry formation of land in that section of the state—the land is very dry and has a poor subsoil down there. At Crookston we have recently acquired four hundred acres of land, and this year have put out some five acres of timber trees with the idea to see what can be done in the line of windbreaks and tree planting in that section of the country, which has so far had so little done for it in that line. Recently, too, the experiment station has been extended by the acquisition of some four hundred and eighty acres in the vicinity of Grand Rapids. On that farm, there are some two hundred acres in timber and on land that is very suitable for timber purposes. A good deal of that land we propose to use to see what can be done in the matter of re-seeding and encouraging a growth of the most valuable timber which will grow in that section of the country. These are briefly some of the outlines of the work we propose to do aside from our work here. On this place, we have quite a little grove, as you see, and we also have a large variety of timber trees. We have especially a large number of fine evergreen saplings, evergreens that are found only on the prairies of the state of Nebraska. We have on hand at present something like nine or ten thousand of these saplings, which we hope to grow upon the prairies of our state. We have also tried to grow the Rocky Mountain trees, which seem especially adapted to a very dry, severe situation. We have somewhere about fifteen hundred of the *picea pungens*; about a thousand, I think, of the.....(?) spruce, which answers for the hemlock, which, as you know, perhaps, does not do very well in this state. The hemlock, as the most of you know, is not a hardy tree in the state of Minnesota; it is found in Minnesota, but in a very limited way. The work of instruction in forestry is carried on in as practical a manner as we are able to do it. It is done by the study of the trees themselves largely, as well as by the study of the theoretical conditions under which they must grow.

Now, while you are here, you must not fail to see what improvements we have made out here. There are quite a number of improvements, a large dining hall is added, which I wish you to see before you leave; the dairy building has been doubled in its capacity, making it the finest building of the kind anywhere; a new sheep barn has been added, a new piggery, new poultry buildings. These are, in brief, something of the additions we have made. We have had all the students we could take care of during the past year—all the students we could well take care of. I do not remember the total enrollment of boys, but think it possibly about three hundred

and twenty, somewhere about that number; and about sixty-seven ladies are in attendance upon the summer school, which closes two weeks from today.

I thank you for your attention, and shall be glad to see you all here at some time and shall be glad to show you about the grounds.

J. O. Barrett: I am pleased to inform the ladies and gentlemen of the meeting that our old friend and co-worker, Col. Stevens, is gradually recovering. He is now able to move his hands and is able to speak quite freely.

Prof. S. B. Green: I would like to offer the following resolution:

RESOLVED, that we hereby request the Division of Forestry of the National Department of Agriculture to co-operate with and aid our State Experiment Station in its study of the best methods of reforesting the cut-over timber lands of this state.

A motion was made and seconded to adopt Prof. Green's resolution, which motion was unanimously carried.

Mr. Harris: I would move that the State Horticultural Society give a vote of thanks to the State Experiment Station for the cordial hospitality we have met with and the generous treatment we have received at their hands, and also that we send our greetings and sympathy to our friend Col. Stevens, and our best wishes for his restoration to health.

J. O. Barrett: And with them this bunch of roses.

President J. M. Underwood: You have heard the motion.

The motion was seconded and unanimously carried.

Governor Pillsbury: As president of the Board of Regents, I take great pleasure in returning to this organization that has met here today our thanks for meeting here on these grounds. I do this with a great deal of pleasure, for this institution is yours, it belongs to every one in the state, and we are exceedingly gratified to have you meet here, and we want you to consider this as your property. These grounds and these buildings are at your disposal at all times. I thank you.

Mr. H. B. Ayres: I would like to add a postscript, so to speak, if it is not asking too much, and introduce a resolution:

RESOLVED, that we encourage the setting apart of some small area of well-timbered university or other state lands to be operated by the university, according to the best system of forestry, for the purpose of illustrating the advantages of forest management.

It is of much importance, I think, to have well stocked lands. The point important to show is that forest management applied to these lands is more profitable than the present lumber operations.

A motion was made, and seconded, to adopt Mr. Ayres' resolution, which motion was unanimously carried.

A. W. Latham: Mr. Chairman, the members of the horticultural society have all heard, no doubt, of the death of our treasurer, Mr. F. G. Gould. He has been a very useful member of our society for a great many years, one of our life members, a pioneer in the work for many years. His loss will be greatly felt, and we shall greatly deplore him. I move, Mr. President, that a committee be appointed to draft suitable resolutions to be presented at our next annual meeting, as a testimonial of our esteem.

Pres. Underwood: I would suggest that a committee be appointed and have resolutions printed in our next monthly magazine.

A motion was made to that effect, seconded, and was unanimously carried.

Meeting adjourned.

BEAUTIFUL RESULT OF GRAFTING.

V. DWINNY.

Nothing perhaps strikes the uninitiated and even the expert with more wonder than the beautiful effects of artistic grafting or budding. But strange to say little is done in this line either in this country or in Europe, except in the so-called weeping trees, which are drooping-limb trees, top-grafted into erect growing sorts of like nature and kind. Even in greenhouses where every facility exists for artistic grafting, I have never seen a herbaceous graft, though startling and beautiful effects may be obtained by grafting opposite colored geraniums, fuchsias, etc., upon each other. The most ready means of accomplishing this in a greenhouse is by inarching. Pots for that purpose can be set side by side and thus this wondrous work can be done with no difficulty, but rather with pleasure.

But in the flower garden and lawn the most striking effect can be had by grafting ornamental and flowering shrubs of the same species upon each other. In this way low bush-like flowering shrubs can be transformed into small flowering trees. Thus the white lilac can be grafted on a branch of the purple sort and trained to a single head and trunk with pleasing results. And thus by top-grafting purple, red and white roses of Sharon (*Althea*) may be made to bloom upon the same bush. Hardy, robust, tall growing roses, as *rosa rugosa* (new Japan-rose) may be used as a stock upon which to bud, graft or inarch white, red or yellow roses, and thus cause a pleasing, as well as wonderful result.—Fruit.

Experiment Stations,

MIDSUMMER REPORTS, 1896.

MINNESOTA STATE EXPERIMENT STATION, ST. ANTHONY PARK.

PROF. S. B. GREEN, SUPT.

In the natural order of things the horticulturist looks over stock in the spring to see how it has come through the winter, and this point is probably the best one for me to begin with on this midsummer report.

In this section the hardier varieties of apples, cherries, plums, currants, gooseberries, raspberries, strawberries and deciduous trees came through the winter in good shape. The Forest Garden plum trees of all ages were somewhat injured, while the Desota, Rollingstone, Wolf, Cheney, Weaver and most others of the American class were not injured at all. The new plums, Wilder and Charles Downing, were killed to the ground. The tenderer varieties of strawberries and raspberries were quite a little injured, while such well known sorts as Crescent, Bederwood and Haverland have generally started well, though evidently somewhat weak when spring opened. Grapes suffered badly in many locations, and most varieties lost their surface roots. Our vines are making a very good growth, and bid fair to recover this year from the severe freeze of May 1st last year.

Many coniferous evergreens were seriously injured. The Scotch and white pine and balsam in exposed situations often losing branches or being killed out. The few Austrian pines on our grounds are looking better than the Scotch at this time, though in former years not appearing nearly so hardy. The Douglas spruce is doing well here, and of the many specimens on our grounds it is difficult to find any that are injured in the least, even in very severe situations. Bull pine and jack pine show no injury, while Norway pine was not injured, except in very exposed places. The Colorado blue spruce and the white spruce were not injured in the least, and Norway spruce very little. Some of our yearling black walnut seedlings were killed out, and the Catalpa was killed to the ground.

All our fruit plants except grapes blossomed full, but plums cherries and gooseberries have not generally set much fruit. The Cheney plum, however, is full of fruit. Apples, raspberries and blackberries promise better than usual, while strawberries are nearly a complete failure, the only variety filling out well being an unnamed seedling of our own, which has fruited for the first time. Our cherries, including Wragg, Ostheim and most of the Russian

sorts, are very vigorous and making pretty trees, but have not yet produced much fruit. Our Juneberry plants are loaded with fruit, as is usual with them. This year we are again making a study of

FIG. 1.-See page 298.

the prevention of tomato rot, varieties and comparison of the yields of potatoes from Northern and Southern grown sets and a special study of potato machinery. We have set out an orchard of 650 seedling apple trees, many of them from hand-crossed seed; put out a

new strawberry bed and added to our raspberry and blackberry plantations so as to keep our selection of varieties up to the times.

Our evergreen seedling beds are in excellent condition, and we have about 12,000 jack and bull pines and Colorado blue spruce for

FIG. 2.—See page 298.

use in our timber planting, besides smaller numbers of many other kinds.

The grounds about the new buildings have been properly graded, seeded and planted out with very good success

At our coteau farm, in Lyon county, we have planted about three acres of forest trees in addition to the plantation of four acres put

out there last year, which is in very good condition. Some small fruits, plums and apples have also been put out there. At the Crookston farm a good beginning has been made in horticultural work, including vegetable gardening and about five acres of trees set out.

At the Grand Rapids farm the conditions are very different from those existing in the other places named, for that station is located on a timber farm, including about 200 acres of natural forest land, which is to be used for experiments in forestry. We have at that point made trial plantings of the fruits most promising for that section.

Our school work has been very successful. The total registration for the boy's school, which closed with the graduating exercises of March 29, was 320. The summer school for girls opened April 28 for a six weeks course and was attended by about seventy students. A new feature of this school which was introduced last year is greenhouse laboratory work. In this part of the course the students learn the simple processes in common use in greenhouses, such as mixing potting soil, potting, seed sowing, pricking out, making and caring for cuttings, etc. Figure No. 1 shows one section of this class in front of the potting shed at the close of a working session. In figure 2, a few members of the class are shown putting cuttings into the propagating bench.

A special feature of the life at the experiment station this spring has been the many visitors here, which plainly shows the station work is of more interest than ever to the farmers of the state, who seem to appreciate the work of all divisions. Three excursions on the Watertown branch of the Minneapolis and St. Louis brought us nearly 500 visitors; five delegations off the Great Northern road brought us about 400 visitors, and we have also had a delegation from Carlton county of about seventy—in all a total of about 1,000 persons, besides many who have come separately. One delegation of eighty-five persons came over the Great Northern railroad from Watertown, South Dakota. The persons comprising these delegations were generally representative men from their respective neighborhoods.

MONTEVIDEO EXPERIMENT STATION.

LYCURGUS R. MOYER, SUPT.

The full annual report of this station, published in the May number of the *HORTICULTURIST*, needs but a brief supplement at this time. The droughty conditions then noted have entirely passed away, and now all kinds of trees and shrubs are rejoicing in abundant moisture.

The oldest experimental trees at this station are Russian willows and poplars. The certinensis poplar and the pyramid poplar are badly infested by borers and cannot long survive. Bolle's poplar is still unaffected and is a fine silver leaved tree.

All the lilacs continue to do well. The white varieties of *syringa vulgaris* were much admired this spring.

The pea trees were unaffected by the drought and bloomed as fully as ever this spring.

The season of the *Philadelphus* is just passing. They are all capital shrubs and have been very showy for the last few days. We especially like 144 Vor.

Some of the leaves on the Manchurian maple (*Acer ginnala*) are affected by blight at the present writing. These shrubs are fruiting, and the seed wings are very beautiful.

All of the Tartarian honeysuckles have been very satisfactory this spring. *Lonicera splendens*, from Professor Budd, is a great acquisition. *Lonicera Alberti* is a narrow leaved honeysuckle that ought to be generally planted. It needs some support. The flowers are very fragrant.

The Ostheim and Suda cherries show some fruit, but it promises to be quite small. The rabbits keep the sand cherry so closely pruned that it produces no fruit.

The spiraeas this spring have been very beautiful, *Van Houttii* was very satisfactory, and so was *spiraea hypericifolia*. *Spiraea Douglassii* is now in bloom.

The Russian, or Polish, privet is nearly all dead this spring; whether it died from drought or from cold weather, it is impossible to say.

Rosa Wichuriana is also dead. *Rosa rugosa* is doing well, and so is the old Scotch rose. The old fashioned blush rose is blighting badly this summer. The yellow roses are all very hardy and satisfactory. Seven Sisters is one of our best roses for the prairies. The red moss rose does well.

A Siberian almond, sent out by Prof. Budd, blooms early in the spring and is quite interesting. It is very hardy.

Herbaceous peonias are entirely hardy on the prairies and ought to be generally planted.

Tulips do well with us but need some protection from the wind while in bloom.

Hyacinths are a failure with us.

Among the new shrubs sent out this spring are *pyrus tortingo*, *viburnum lantana*, *syringa villosa*, double white Siberian lilac and *elaagnus angustifolia*.

The only Russian apple tree that is showing any fruit is No. 22 M. The Wyant is showing a few plums, but otherwise the plum crop is a failure. White spruce, Scotch pine, red cedar, Mugho pine and *picea pungens* are doing well. Balsam fir has suffered much damage from the drought. The Norway spruce, with one exception, are all dead. Black spruce has failed too, along with white pine.

June 25, 1896.

IRRIGATION AS APPLIED TO HORTICULTURE was discussed at great length before the late meeting of the Kansas state horticultural society. Delegates from the western part of the state as well as others dwelt at length upon the possibilities of garden and orchard irrigation from wells. The underflow is very strong and almost inexhaustible. Orchards of 10 to 100 acres are quite common, and the owners are prosperous and contented. Young men are urged to acquire such homes. This season more farms are being equipped with irrigation outfits than ever before.

WINDOM EXPERIMENT STATION.

DEWAIN COOK, SUPT.

Most varieties of trees and plants wintered very well. A good many varieties of apples are fruiting with me this season for the first time, and no blight has yet appeared. The Pride of Minneapolis drops its fruit too easily to be of much value in this windy country, and the foliage of the Virginia has been injured by winds more than most other varieties. As yet, no variety of apple is as sure and early a bearer as the Duchess.

I have added to my selection of apples this season nearly forty varieties of Wisconsin seedlings, through the kindness of Wm. Stammer, who conducts an experiment station at South Osborne, Wisconsin. They were top-worked on bearing trees, and we may expect to hear from them soon. Most varieties of apples that bloomed this spring are bearing now, as the weather was favorable for the fertilization of the bloom.

Plums will be a short crop, as last spring we had five continuous days of very hard and hot south winds, covering the entire blooming period; nevertheless, the Wolf, Desota and Wood are bearing their usual good crops. The Hawkeye and Wyant are also well loaded, while the New Ulm is overloaded. The Forest Garden has but little fruit, and they are mostly dead or dying; the Cheney, Rollingstone, Rockford and Knudson's Peach are a dismal failure as far as producing fruit is concerned. Five trees of the Superior plum, sent me this spring through the kindness of the Jewell Nursery Co., are making a wonderful growth. I look for something extra from this plum.

The strawberry crop will not be very large; first picking for market, June 18th; varieties, Enhance, Crescent, Capt. Jack, Cumberland, Bederwood and Princess. All are doing very well, but none better than the Bederwood and Crescent.

The currants are promising, but I think they will not be as good as in 1895. The Red Dutch is taking the lead.

As to grapes, we have been plowing up most of ours and will probably save nothing except the Worden. My land is too flat for grapes.

June 20, 1896.

LA CRESCENT EXPERIMENT STATION.

J. S. HARRIS, SUPT.

The great drouth that prevailed over this section of country in 1895 is indeed broken by an excessive precipitation of moisture, but its injurious effects upon trees and fruit bearing plants are very plainly visible and may be felt for some time to come. This station is located in about the driest part of the dry region, and there was so little moisture in the soil during the past autumn and at the beginning of winter, that we greatly feared a repetition of the calamity of 1872-3, when our orchard, vineyards and small fruit plantations were destroyed by root-killing; but fortunately the winter was comparatively mild and the atmosphere not as dry as during our

average winters. The injury done was underground and out of sight, but the conditions that have so far prevailed since the close of the winter have been such as to favor recuperation and start growth and not call upon the roots for reinforcements before they have had time to acquire any reserve force; and I am of the opinion that the damage done will not be very great beyond injury to the crops of the present year and perhaps the next year following, which may result from the loss of fruit spurs through the agency of blight, that is very severe in some localities.

The strawberry season is past, and the crop on the station was even a greater failure than it was last year when cut off by frost. The causes we attribute it to are, first, a weak root system, caused by the drouth; second, the loss of many roots by winter-killing; third, an early luxuriant growth of foliage forced by atmospheric conditions before the roots had made any growth—cloudy weather and too much rain while in bloom preventing pollenization and followed by hot blighting winds that occurred during the early part of May. The result is very few fully developed berries. Old grassy beds have done much better than plantations made the last year. There seemed to be no particular difference in the yield and quality of the older varieties.

Among the newer varieties on trial, the Sparta, a new variety from the Thayer Fruit Farm, is very promising as a pollenizer and as a market berry. The fruit is of a rich deep color, texture firm, flavor good. Next to the Sparta, the Robinson gave the best yield of merchantable fruit of all of the staminate varieties. Of pistillates, the Timbrel is a fine bearer of excellent fruit for home use, but not desirable for market. The Greenville also produced better than the Warfield, Crescent or Bubach.

The winter was hard on the raspberry, especially the reds, which were badly killed back to where protection was given and to the ground when not protected, and the Shaffer, which suffered worse than any other variety, either red or black. We had two plants each of the Loudon and Columbian raspberries, furnished us last spring by Professor Green; neither of them were laid down or covered during the winter. The Loudon came through without injury; the Columbian was badly killed back, but canes starting near the surface of the ground are now well loaded with fruit. The promise now is for a fine crop of blackcaps. The Palmer, Older and Ohio were the least injured by the winter. The crop of currants and goosberries is a failure, therefore we will have no opportunity to make comparison. Of blackberries, we have abandoned the cultivation, except a few for home use, for which purpose we find the Ancient Briton the best and most reliable.

Native Plums:—Our trees apparently endured the winter perfectly and bloomed most profusely. The weather was unfavorable at the time of blooming, especially for the earlier varieties, being cloudy and showery, and no insects of any kind were about them before the bloom had fallen, except on the Desota and Rollingstone, that bloomed about two days later. The trees of most of the varieties are not carrying any fruit, but the Desota is bearing abundantly

and the Rollingsstone fairly well. The Cheney is carrying some fruit and matured an immense crop of plum pockets. We have two trees of the Townsend seedling of the Lombard; they endured the winter well and are carrying some fruit.

Grapes:—Our grape vines made a lighter growth of wood last season than usual, but have come out vigorous and healthy. The promotion of clusters and bloom gave promise of a large crop, but heavy showers and cloudy weather has interfered with perfect pollenization and considerably lowered the prospects for more than an average crop. Our experience demonstrates that the most profitable varieties for southeastern Minnesota for market are Concord, Worden, Moores Early, Brighton and Delaware, with Moore's Diamond very promising. For home use the Early Victor is very desirable.

Apples:—With many varieties of the apple there is something wrong. Never before at the blooming period had we so encouraging a prospect of a bountiful crop, but first comes a spur blight which cut off three-fourths of the spurs that bloomed and set fruit, and this is being followed with twig or fire blight. The varieties worst affected by the spur blight are Tetofsky, McMahon, Autumn Streaked, Duchess of Oldenburg, Wealthy, Talmon Sweet and Transcendent and some other crabs. The fire blight is the worst on the Russian, Autumn Streaked, Arabian, Talmon Sweet, Wealthy and some of the Siberian species, but there is hardly a variety that has reached a bearing age that is entirely exempt. I have theories on the subject, but to present them now will make this report too long, and before airing them I wish to make farther observations.

Additions to the lists on trial made this season:—A number of the newer varieties of strawberries were purchased and planted this spring, but unfortunately scarcely a plant has lived. Later we set 200 plants of the Sparta, losing but a single plant. The Rio and Gandy are also on trial. Also put out 200 plants of the Loodon and a dozen of the Miller red raspberry. Four varieties of cherries have been planted. The Superior plum, from the Jewell Nursery, is also on trial, also Alundane and Burbank (Japanese). A new plot of apple orchard containing about 250 trees in fifty varieties has been planted expressly for experimental purposes. This plot is on a rather steep side hill with northern aspect and was originally covered with a heavy growth of young timber, chiefly red and white oak, birch and hickory. As before reported, the timber was cleared off and the holes dug last fall, but the trees were planted this spring. About thirty more new or unknown varieties have also been placed in the nursery.

The pear trees are carrying some fruit, but not as much as last year, and some of the trees are showing blight. The crop of nuts will be very light. Chestnut trees do not show injury. Some of the hickory were injured by last season's drouth on southern exposures.

Summary:—Some things that we think we are learning.

First. That a home grown tree or plant or one from a near-by nursery that is carefully dug with plenty of roots and set at once is worth as much to the planter as a half dozen grown a long distance away, dug, boxed or bundled and exposed in transit and delivery, and that but very few men will make a success of fruit growing as

long as they continue to purchase from agents of unknown nursery firms or from foreign nurseries long distances away, instead of raising their own stock or securing it of reliable local nurserymen.

Second. That too close planting of trees is not advisable in a climate subject to frequent drouths.

Third. That the very general failure of the strawberry crop this season is a result of the long drouth that prevailed last season.

June 19, 1896.

ALBERT LEA EXPERIMENT STATION.

CLARENCE WEDGE, SUPT.

Apples.—Nearly all varieties came through the winter in good condition, and at this date, June 18, almost everything of bearing age has safely set the finest crop we have ever had at this season of the year; even some of the Lieby and Virginia in the nursery row are showing a few apples. The following kinds seem to have proved themselves heavy bearers with us: Duchess, Wealthy, Tetofsky, Hibernial, Longfield, Charlamoff, Repka Malenka, Patten's Greening, Ostrekoff (4 M), Czar's Thorn and Transparent. All trees of the Anis family are very moderate bearers and will produce pecks while the Longfield will barrels; they are, however, very regular in the quantity that they do bear and will doubtless stand well some hundreds of miles further north than the latter. Yellow Sweet is bearing better than ever before, and if it continues to improve will be one of our good kinds. Summer Lowland is still a very shy bearer. Antonovka, set eleven years, has until this year borne only specimen apples and has but a light crop now. McMahon is also quite tardy. Of the younger trees that show signs of good bearing, we note Peerless, Newell's Winter, Titus, Peter and several of the Hibernial family. Of the crabs, the Strawberry, Martha and Briar Sweet are very heavy bearers, and the Virginia is proving an extra early bearer on our soil.

Blight is not serious in any part of the orchard, although many spurs on bearing Wealthy, Czar's Thorn and Tetofsky have blighted and give the trees a bad appearance. The Transparent blights more or less every year. We have not had a severe visitation of blight since about 1885, when all our Transcendents and Hyslops were wiped out, and we begin to think that our rather thin yellow clay soil and elevated situation may have much to do with our immunity from this disease. Our orchards are and always have been under clean cultivation, with but a very small part of them mulched.

Some of our best trees have lately been slightly injured by sun-scald, and we note that the apple seems to be very susceptible to this injury just as the trunk begins to put on a rough bark. We have protected nearly all our older trees by lath screens and shall

put veneers on all our young orchard trees before the first of Sept., as we find that there is so much risk of injury from rabbits, mice and sunscald that it is very unwise to be without this cheap insurance against such destructive agencies. Although we have made a business of destroying rabbits in our vicinity and have thinned them down to very moderate numbers, several of our orchard trees set this season after May 10th were seriously barked by this persistent pest.

Plums.—A good crop of plums seems assured. We are much pleased with the behavior of what few trees we have worked on sand cherry stocks. The union is in all cases perfect, the trees stand up well, although budded and standing two or three inches above the surface. One tree of the Rockford, budded two years last August, is loaded with fruit and is the usual size of a five years old tree. The Stoddard, which has been a favorite with us, comes out looking very poorly this spring, all trees from one to five years old looking thin and weak and killing back from the tips. Several Russian plums are looking fairly well, but we find them all rather tardy bearers.

Cherries.—The Russian cherries are all looking extremely well, also some Ostheim received from Chas. Luedloff eleven years ago, but we do not as yet have enough fruit to form a just estimate of their quality. The Nebraska form of the sand cherry fruits abundantly with us, and we have discovered among a large number of seedlings one of particular value, entirely free from astringency, of good acidity, as large as the best, moderate sized pit, and on account of its great hardiness, productiveness and early bearing likely to be of value for the Northwest. The Compass cherry, originated by Mr. Knudson, of Springfield, is fruiting very abundantly on trees of only one year's growth. It shows in many ways its curious parentage—takes well on both plum and sand cherry and easily makes a good four to five foot nursery tree in one year on either stock. Like the sand cherry, it is not visited by the curculio, and, like the plum, the fruit is of a clear, bright red color. The pit is an interesting compromise between the sand cherry and plum.

Strawberries.—The Bederwood and Lovett are the best of our staminate varieties, and the Crescent and Warfield of the pistillate. We find that our plantations that are under the shelter of wind-breaks have done far better the past two seasons than those in open exposure, and think that, as a rule, it is a great advantage to plant all small fruits in sheltered situations. We find that the close shelter and even shade of the evergreen and apple tree is rather grateful than otherwise to all such plants, while the cottonwood, box elder, soft maple and such like trees, appear to rob the plants for several rods from their stems.

This report might be very greatly extended, but we believe we have noted the experience of most value to our members. With such abundant moisture in our soil and the trees and plants in such healthy and beautiful condition, the present prospect is certainly very encouraging.

June 18, 1896.

MINNESOTA CITY EXPERIMENT STATION.

O. M. LORD, SUPT.

The first ripe strawberries were picked May 30. The last strawberries were picked June 24.

The Warfield and Bederwood gave the best yield. All varieties were inferior in size and quality. Red and black raspberries are from one-third to half a crop; quality good. Blackberries now promise a good crop. Cherries failed, also currants and gooseberries. Apples set very well, but are falling off badly, and the trees much blighted. The weather has been excessively wet for fruit. Grapes are well set, and the vines appear vigorous.

All trees and plants are making vigorous growth. The Cheney, Rockford, Hawkeye, Wolf, Cottrell and a few other kinds are fruiting heavily. Rollingstone, Desota and many others have no plums.

June 26, 1896.

July Calendar.

J. S. HARRIS.

He who has planted trees has done well, but he who is watching them and caring for their healthy growth is doing better. Both in orchard and nursery some pruning is necessary, and now until the middle of July is the very best season of the year for light pruning and shaping the heads of trees. There would seldom arise any occasion for heavy pruning if the young trees were properly looked after. The rubbing off of a surplus bud here and pinching in a rampant shoot there, and the judicious use of the pocket knife as occasion requires, would soon put the young orchard in the way it should go. A limb should never be removed unless something is to be gained. Injudicious removals of branches because it is the season for pruning should not be commended.

Never use the axe or the hatchet for pruning. For large branches use a sharp saw with wide set teeth, and leave a smooth cut by paring it carefully with the knife or chisel, and cover all wounds that will not heal over in a single season with grafting wax or shellac varnish. Form the heads of trees while young. For this climate low heads are the best to shade and protect the trunk by their overhanging branches, but they should not be so low that large branches must necessarily be removed in after years. About three feet is a good height to start the head. It is better to shade the trunk a few years than start it lower. This is a good season to remove suckers and root sprouts; although they may afford some protection against sunscald they do a greater injury in diverting the sap from the tree and impeding its growth.

Trees in the nursery should be frequently looked over, and wherever a branch starts in a place where it will not be needed or where it will make a sharp fork, it should be promptly removed.

Grafts set last spring will now show whether they have taken. In cleft-grafting, often two scions have been inserted; when both have taken, one should be removed, or a dangerous fork will be formed that at some future time may ruin the tree by splitting apart. Insects will still be getting in their injurious work and should be looked after and destroyed whenever discovered.

Because the fore part of the season has been wet, mulching must not be forgotten. The wet has had a tendency to cause a free growth of trees without a corresponding growth of the deeper roots, and extreme heat and drouth in July and August will bring disaster. In July we expect scorching hot weather, and very likely some weeks of drouth. Mulching is necessary to even up the temperature of the soil and prevent the rapid evaporation of moisture. It may be a dust mulch by frequent shallow cultivation of the surface, or an application of fresh mown clover, broken straw or other material—even clear sand is good.

In the fruit garden. Raspberries are now in full bearing and will need to be picked daily. As soon as all the crop is gathered, cut out the old canes and surplus new ones, leaving enough for next year's fruiting, and keep well hoed. Weak and needless shoots may be removed from the currants, and any branches infested with borers should be cut off and burned. If another crop of worms appears after the fruit is gathered, give the borers a thorough spraying with the Paris green solution. Keep the blackberries hoed or mulched and tie up heavy fruiting branches to the trellis. Grape vines that are not fruiting need equal care with others. It is of great importance to encourage a strong growth of young wood; keep the fruiting vines well tied to trellis or stakes; do not pull or break out laterals, but it is well to pinch out the point after a good leaf has formed and again after the next has formed. Also keep a good look out for insects. In case mildew or rot appears, spray with Bordeaux mixture.

The two last seasons have shown the weakness of holding strawberry beds more than one season. Beds to be carried over should be mowed and hand weeded or burned over, and the rows narrowed up when cultivating the alleys between. The application of well rotted manure will give paying results. The beds set this season should be kept thoroughly cultivated and hoed, and it pays to spend a little time in directing runners, to form plants where wanted and not let them get too thick in patches. After enough plants have formed, keep the runners cut off to prevent the formation of more and save the strength in the plants for next year's fruiting.

In the kitchen garden the crops are generally well established, but as a good crop of vegetables and of weeds and grass cannot be grown at the same time, so the success will depend in great part upon the thoroughness of the midsummer's hoeing and cultivation. Small weeds are more easily destroyed than larger ones, and a single weed should not be allowed to pass between the hoeings.

The lawn. Although the abundance of the spring flowering is over, the lawn and flower garden should not be allowed to run into neglect. Weeds should be kept out, plants kept tied up and unsightly flower stalks removed, and an air of neatness secured throughout the entire season.

Your Corner.

"We have been looking forward to a good crop of strawberries; but, alas, our hopes are blasted. A complete failure or nearly so, anyway, and what there is, very inferior. Raspberries about one-half crop; blackberries look very good.

"Minnesota City, Minn., June 9, 1896.

H. M. PIERCE."

"The prospects for apples is the best we ever had. The Duchess that bore so heavily last year are loaded again this year. There will be lots of crabs of all kinds. Wealthy, about half a crop. Lots of strawberries, but raspberries killed back badly.

"Hammond, Minn., June 8, 1896.

J. A. HOWARD."

"The fruit outlook in this vicinity is so and so. Apples promise to yield a fair crop if nothing intervenes. The plums are a failure, owing to a hard windstorm that raged at the time the flowers were forming. There are also a whole lot of plum pockets on the trees. Blackberries, raspberries and strawberries will yield an ordinary crop while currants and gooseberries are failures. Most of the flowering shrubs, such as the snowball weigelia, rosea, spirea Bumalda, spirea van Houtii, Philadelphus, and hydrangea paniculata grandiflora stood the winter unprotected without being the least winter killed.

"Hader, Minn., June 15, 1896.

LARS J. GJEMSE."

"Will any one tell me how to can asparagus successfully? It is done at factories, but, with the best of rubbers and other preparations, I fail; hence, think some substance must be added, as in the case of sweet corn.

"Neighbors who tried it last year recommended a new way of canning pieplant. My can is nearly three weeks old, and perfect so far.

"Peel the pieplant, cut in half inch pieces, pack in a cold can with a hammer handle, or some stick with a flat end. Set in a pail of cold water deep enough so the water will flow over the top of the can. Wait for the bubbles of air to come up through, or hasten them by running a tablespoon handle into can; remove the can from the water when the former seems quite free from bubbles, and screw the head on immediately. It is designed especially for pies, which, of course, will be like summer ones.

"West Salem, Wis., June 16, 1896.

IDA E. TILSON."

Secretary's Corner.

IS YOUR MEMBERSHIP RENEWED FOR 1896?—Quite a number of our members have not yet renewed for the current year. If *you* are of this number please send the annual fee to the secretary *now*, while you think of it and save the trouble of a special personal appeal.

SECRETARY MRS. MARTHA SHUTE.—The present secretary of the Colorado State Horticultural Society is a Denver lady of the above name. Nebraska also had a lady in this office the latter part of last year, the widow of the secretary, who was accidentally killed in a railway accident.

COLLECTION OF STRAWBERRIES IN POTS.—Among items of interest at the coming fair, if contemplated plans succeed, will be an exhibit of a very full line of named varieties of strawberries, to be shown by Prof. Green, from the state experiment station. This will give a rare opportunity to study the different varieties in convenient juxtaposition.

"AMATEUR FRUIT GROWING."—Speaking of the work of Professor Green, a correspondent says, "a fine book—just what I wanted." *You* can have a copy of it too gratuitously by sending in a new member for the society. Take a few minutes off and show your neighbor the advantages of belonging to the Minnesota State Horticultural Society.

GENERAL FRUIT PROSPECTS.—Reports from all parts of the country show general prospects for all kinds of fruit east of the Rocky mountains are fully equal to the very best for years. The most striking feature of the information gathered is the remarkable uniformity of the returns. If the season ends as it opens it bids fair to be one of low prices.

THE FRONTISPIECE.—The view of the fruit exhibit appearing at the head of this number was prepared soon after the last state fair, but a press of other matter prevented its immediate use. It is so fine a view it should be preserved, and so it appears here, although a little late. It can be used for purposes of comparison with the next exhibit.

AN EXHIBIT OF RUSSIAN APPLES FROM IOWA.—The Minnesota state fair management has appropriated \$25 to pay the expense of an exhibit of Russian apples from Iowa, of which Prof. J. L. Budd says he can show a hundred varieties. We are glad arrangements are being made for his attendance and the interesting exhibit of fruit that he brings with him.

OUR NEW TREASURER.—Mr. A. H. Brackett, of Long Lake, has been appointed treasurer for the unfinished term to fill the vacancy caused by the death of our esteemed late member, Mr. F. G. Gould. Mr. Brackett, although one of the younger members of the society, is earnest and thoroughgoing and a practical horticulturist, and is well known to all who are in the habit of attending our associations. His appointment will give general satisfaction.

THE FRUIT GROWER'S UNION.—This organization, which was referred to in the last number, will have its headquarters in Chicago and send out daily bulletins of prices, supply and demand to every shipping point throughout the country. If conducted fairly in the interest of its members, this union should accomplish much for the fruit growers of the country. Heretofore their sources of information have been largely under the control of commission men or consumers.

MEEHAN'S MONTHLY.—The July No. of this valuable journal is on our table. We prize this magazine for the freshness, originality and versatility of its contents, its perusal always disclosing many items of special interest. This number has as a frontispiece a colored plate of a beautiful variety of the fern family, Goldie's Shield fern. The size and shape of this monthly is very suitable for binding for permanent preservation, a feature that is overlooked in some other valuable periodicals, and the practice of slipping a piece of stiff pasteboard into the envelopes alongside brings it to the subscribers without injury from bending.

FORESTRY LEGISLATION.—The executive committee in session directly after the summer meeting considered the resolution presented by Mr. D. R. McGinnis and adopted by the society, and appointed a sub-committee consisting of President Underwood, Mr. Wyman Elliot and Secretary Latham to take the necessary steps looking towards the accomplishment of the purpose of the resolution. This committee, in association with other gentlemen, will select a suitable committee to draft and present to the next legislature a forestry protection law embodying the most advanced views on this subject and also to include, it is likely, the proposition of Captain Cross.

PROTECTING THE FORESTS FROM FIRES.—The first annual report of Gen. C. C. Andrews, who holds the position of fire warden under the late law for forest preservation, is just issued and will be found valuable reading for all interested in this important subject. Besides detailing his methods of placing his office in touch with those who are to attend directly to the execution of the law, and reciting the results, the report contains also a map of the pine regions of the state, estimates by counties of the trees standing in the timber counties, statistical information from many of those engaged in the logging business, a compilation of the views of a large number of woodsmen on the re-forestation of the pine lands, etc. On this last subject, the consensus of opinion seems to be that when the fires are kept out the young pines will soon appear. The expenses of the fire warden's office for the year show a total of \$2,020.00.

THE STATE FRUIT FARM.—This farm, located on the south shore of Lake Minnetonka, has lately changed hands, and that portion which was planted by Mr. P. M. Gideon as an experiment orchard has become the property of Judge R. Jamison, of Minneapolis. The Judge has lately built him a summer house on the old Gideon farm, and is turning his attention with much zeal in the direction of horticulture, in the improvement of a twenty-five acre tract in that vicinity. The acquirement of the old experiment orchard is a supreme opportunity, which should be improved to the utmost. Mr. Gideon planted many hardy seedlings in this orchard, and though not all desirable for fruit, by top-working they may be brought into profitable bearing. The development of this property under Judge Jamison's management will be watched with great interest by all horticulturists in this section who are cognizant with the conditions. We are pleased to report the present owner as an enthusiastic member of this society.

MISSOURI BOTANICAL GARDENS.—These gardens, located at St. Louis, were instituted and are maintained by the bequest of Henry Shaw, evidently, judging by some of the conditions of the bequest, a rather eccentric man. In establishing these gardens, he has laid posterity under very great obligations. The seventh annual report, an elegant volume of 200 pages, is just received. It is much too technical for review by an amateur, but is after all an interesting book to examine on account of its fine engravings and occasional non-technical descriptions. This is the third volume from this source now on our shelves. We note that the gardens now contain 301 named species of trees, 561 of shrubs and 1,129 of hardy perennial herbaceous flowering plants. The herbarium contains 250,000 specimens.

The work done seems to be very comprehensive and to include every branch of horticulture in all its details, not omitting even fruits and vegetables. The scope and importance of the investigations being made here may be understood when Prof. H. W. Rogers of the Northwestern University speaks of "these magnificent gardens, unsurpassed by any gardens in the world, unless it be by the famous Kent Gardens in London."

There is also a school of botany connected with it.

SEND YOUR FRUIT TO COLD STORAGE FOR THE STATE FAIR AND THE WINTER MEETING.—Arrangements have been made here, as were made last year, for placing in cold storage fruits either designed for the state fair or for the winter meeting of this society, and it is hoped that a large number will avail themselves of the opportunity to do so. The fruit will be stored free of charge for either purpose, and where intended for the state fair will be carried free from the cold storage warehouse to the fair grounds. Tags necessary to be used in such shipments will be sent on application to the secretary of the horticultural society. The exhibit at the last state fair, as also at the last winter meeting of our society, was a very satisfactory one, but we hope this year to make a still better showing, and it would seem that we might do so with the increased

quantity of fruit to be found in the Minnesota orchards. Those who intend to store for these exhibits should gather their fruit while still hard. This is a very important point. Wrap each specimen carefully as taken from the trees to prevent bruising, and send immediately by express to the cold storage as directed. The secretary should be notified of all such shipments. It will not be necessary to send a notice to the cold storage house.

There are many varieties of apples that can be kept up to the time of the state fair, but earlier varieties need to be stored. You may have the necessary facilities for doing so at home and thus save some trouble.

The premiums offered by the state fair management and those which will be offered by the horticultural society next winter will, we hope, fully compensate for any trouble you may be put to in making the exhibits. We are all interested to a large degree in the high standard of merit which our society has achieved, without the assistance of which no such collections of fruits could be got together as we are in the habit of displaying

INJURY TO THE NEW YORK VINEYARDS:—There seems to be no doubt that the grape vines in the western New York vineyard region are in a seriously injured condition and will show it very much in the amount of this crop, perhaps require several years to fully recover. Prof. E. G. Lodeman, who, according to "Fruit," has recently visited the vineyards of Chautauqua county, is inclined to ascribe the injury to the severe frost of May 12, 1895, which caught the vines with a long succulent growth of cane. A correspondent of the *American Agriculturist*, writing from Genesee county, an adjoining county, refers their injured condition to the extreme cold of the past winter, which touched the unusual extreme of 25° below. (It must be remembered that in that section the grape vines are not buried.) He says:

"The appearance of the grapes is enough to make any one weep. That miserable old Clinton comes out smiling, with every bud growing. Worden, Cottage and Martha are very little hurt. Dutchess, Prentice, Jefferson and Victoria show no sign of life anywhere and seem to be dead even in root. Of forty-five other varieties grown by the writer, there seems to be little difference. They are starting out below the snow line, and there are now and then occasional weak, sickly shoots that have started from a dormant bud above the snow's protection."

(Later reports show, as is usually the case, much less injury than at first appeared.)

HORTICULTURE IN NORTHERN MINNESOTA.—A pleasant trip in the pine regions of northern Minnesota last week gave an opportunity to note some of the matters of interest to our horticultural friends in that section. Grand Rapids, the extreme northern point visited, which is in about the latitude of Fargo, N. D., seems like an entirely different world on account of the difference in the character of the soil and of the trees and other plants growing there. The Mississippi river at this point is but a narrow stream, a hundred or

two feet wide, and with the large amount of land overflowed in its course by the dam built by the government and the great number of lakes in that section the climate must necessarily be influenced favorably in the matter of exemption from frosts. While a large portion of the country is swamp lands and white pine lands, the latter of which are usually of a light, sandy soil, yet much of the territory is covered with a vigorous growth of hard wood, and the shrubs and wild flowers and fruits found through the timber are very much the same nature as those in the latitude of Minneapolis.

There are few cultivated fruits growing in this section, although some have been planted in the town of Grand Rapids, a thriving place of some 1,500 inhabitants. The country around is just being opened to settlement and, with a few notable exceptions, there are no clearings that yet deserve the name of farms. But that locality is certain in time to become a prosperous farming community. Its wild fruits are most abundant, and in number of species and varieties considerably exceeds those grown in the big woods section of Minnesota. Several varieties of blueberries, the sand cherry, Juneberry, and several others could be named which are not found native in the big woods region. Especially strawberries grow wild in the greatest abundance, and are of large size and exquisite flavor. Both the Alpine and the Virginiana varieties are found freely intermingled. The adaptability of that locality to the culture of small fruits is certainly assured, and it is certain that crab apples, and possibly the pyrus malus, may be grown there.

Our New England friends would be delighted to find in abundance growing there naturally in the pine woods the fragrant trailing arbutus and the wintergreen, or checkerberry, as they grew with us in "Auld Lang Syne."

An opportunity of a few hours at Duluth revealed similar conditions in that section, where the soil and vegetation are much the same as at Grand Rapids, the age of the place making certain, however, what only seems probable at the newer locality. There are to be found there many fine trees of the crab varieties, and I saw some very nice Duchess, 15 to 18 years old, in bearing, that looked healthy, only showing lack of vigor from standing in the grass. Evidently any kind of tree or shrub that will grow in the locality of Minneapolis will thrive at Duluth and ripen its fruit, taking into consideration always the fact that the summer is somewhat shorter at that lake port, and comes on nearly a month later in the spring. At this time, June 25, the snowball is just in flower there.

I saw some fine specimens of the horse chestnut, although in some places they were sun-scalded on the south side; also handsome bearing cherry trees. Lake Superior is an important factor in the situation there not to be overlooked.

The small fruits of this section are famous for their productiveness and size. Mr. Bovee, at Carleton, a point twenty miles southwest of Duluth, on the St. Paul and Duluth railroad, has, I understand, fifteen acres of strawberries. The growing of strawberries and raspberries for late shipment to the Twin City markets is, I am satisfied, an industry that will eventually be developed on a large scale.

H. E. Wandsman

PARKSLEY, VA.

THE MINNESOTA HORTICULTURIST.

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AUGUST, 1896.

NO. 8.

Biography.

H. E. VAN DEMAN, PARKSLEY, VA.

(See frontispiece.)

The subject of this sketch was born on a farm near Frankfort, Ross County, Ohio, Nov. 3, 1845. His early education was received in the public schools of that place, and later he attended an academy at South Salem. At the age of seventeen, he enlisted as a soldier in the War of the Rebellion, serving as a private in Company A, in the 1st Ohio Heavy Artillery, his term of service running from June 5, 1863, to the close of the war in 1865. After his discharge he resumed his studies, but soon decided to follow fruit growing as a life work, and gave up his plans of attending college and found work with a practical fruit grower, in order to get the training he needed under a competent preceptor. For a few months he worked on the famous fruit farm of J. Knox, near Pittsburg, Pa., and afterwards, during the years '67 and '68, under the personal supervision of the noted pomologist, the late Dr. John A. Warder, at North Bend, Ohio. By working with the other laborers in the orchards, vineyards and berry fields, and by pursuing his studies of botany and scientific literature at night and as occasion offered, something like the same end was reached as is now attained by those who take an agricultural course.

He spent the next two years helping a brother clear away a forest and planted a small fruit farm in the wilderness of northern Michigan. Later he went to Kansas and bought an eighty acre farm, which was afterwards increased to 240 acres, near Geneva, Allen county. A portion of this he planted to fruits of all suitable varieties.

After seven years of pioneer life on the Kansas prairies, he received a call to fill the chair of botany and practical horticulture in the Kansas Agricultural College. He occupied this position during the years 1878 and 1879 and then gave it up to renew active work on his farm.

Mr. Van Deman made it a practice to attend the various local, state, national and international meetings and fruit shows, either as member, exhibitor or awarding judge, as occasion required. In 1885 he conceived the idea of the instituting a division of pomology in the United States Department of Agriculture, and after its creation in 1886 was called to be its chief. This required his removal from the farm to a residence in Washington, D. C. He planned and organized the pomological division up to Secretary Morton's administration of the Agricultural Department, which closed his connection therewith.

At present Mr. Van Deman is conducting a fruit farm at Parksley, Va. He is still in the prime of life, and with his qualifications and experience has yet his best years and his best work before him.

Vice-Presidents' Reports.

ANNUAL MEETING, DEC. 3, 1895.

FIRST CONGRESSIONAL DISTRICT.

E. H. S. DARTT, VICE-PRESIDENT, OWATONNA.

Mr. President and Members:

The climatic conditions of the last year (1895) have not been favorable to the production of fruit in this district. The winter of moderate severity was followed by late spring frosts, which seemed to injure fruit of all kinds, so that it is not likely that over one-fourth of an average crop was harvested. Our long succession of mild winters has promoted or permitted the growth of many varieties not adapted to this climate and has paved the way for the selling of a great many trees and plants of this class, which must ultimately bring disaster and consequent discouragement to the purchasers. I think it was Barnum that said in substance: "The people love to be humbugged," and that Barnum was right seems to be proven by their eagerness to bite at what seems to us to be the naked hook and buy boomed sorts, budded trees and model orchards of the shysters who go up and down in our land seeking whom they may defraud. I see no remedy for this deplorable state of things except for the people to adhere strictly to the rule, never to buy from strangers and give no orders to nurserymen or nursery companies unless they have a well established and unsullied reputation.

The protection of the orchard against trespassers is a matter that appears to be worthy of your consideration and is of much importance to those having orchards in close proximity to cities and villages. The idea prevails to some extent that melons and apples are and ought to be free plunder for boys. I have heard a man of high standing say that a boy who would not steal apples would not amount to much, and this same class of men frequently tell, with a seeming pride and in the presence of boys, of their wonderful exploits in robbing orchards in their younger days, nearly always giving as an excuse that the owner of the orchard was a stingy old fellow. Thus the boys get the impression that it is no crime to steal apples, provided they find a stingy old fellow to steal from, and where orchards are very scarce they cannot afford to be very particular on this point.

Our friend Brand has had experience in this line. He took special pains to be liberal with the boys of a poor old widow; a little later these same boys stole the rare specimens that he was most anxious to keep. Liberality will not save an apple crop. If only boys would steal, damages might be comparatively light, but they are joined by

men, women and children with aprons, pails, baskets and sacks. Will women steal? Was not the first crime of apple stealing charged up to Eve? Her excuse should have been that Adam was stupid and did not provide for his own household, and she was obliged to help herself. But Eve was a good woman and would not give Adam away, so she slandered the snake. Women of today who steal apples can often charge the crime back on their lazy, shiftless husbands who neglect to plant orchards.

I offer the following suggestions: Impress upon all that it is disgraceful to steal, whether they rob an orchard, a henroost or a bank. Enforce the laws we now have and ask the legislature to increase the penalties. Surround the orchard with a high, tight, barbwire fence and, if necessary, place a man inside with a shotgun.

Fruit trees have gone into winter under seemingly favorable conditions, and we may reasonably hope that a bounteous harvest will follow.

SECOND CONGRESSIONAL DISTRICT.

S. D. RICHARDSON, VICE-PRESIDENT, WINNEBAGO CITY.

Fruit of all kinds was the nearest a failure that it has been for years. In town and in a few isolated cases on the high prairie or on the south side of a lake, there were a few apples and plums that escaped the frost. Some of the poorest and most worthless of the wild plums survived. Red raspberry canes all winter-killed. The Shaeffer came through all right without covering, but the blossoms were ruined by the frost. Some of the black-caps bore heavily, but the birds were hungry and gathered the most of them. Strawberries were poorer than last year; the frost and hot, dry weather were too much for them—we did not have as much rain here this summer as there was further east and north. Grapes were killed but set the second time and ripened a fair crop of fair quality. Currants and gooseberries were thinned by the freeze, but on good ground and where they had good care were a fair crop.

FRUIT SUCCEEDING BEST IN THIS DISTRICT.

The hardiest apples for planting in Minnesota are the Duchess and Hibernial.

The apples and crabs that have paid the best in dollars and cents in this section for the past ten years are the Wealthy, Duchess, Tetofsky, Minnesota, Early Strawberry and Meader's Winter.

The Tetofsky does better on ground that is dry on the surface but where water can be obtained in ordinary years by digging twenty or thirty feet. The Longfield promises well and so do many others—some seedlings, some old varieties and some Russians, that if they do as well in the next ten years as they have in the past will be worthy of general cultivation. Many of them are controlled by persons who will keep the public fully posted as to their merits, and they do not need to be endorsed by this society in order to be generally introduced. The tree agent will take care that they are not forgotten.

The Repka Malenka seems to be the best tested and the best keeper of the many candidates for the coming winter apple. It keeps as well apparently as the Soulard crab, the Roman Stem, Talmon Sweet, Allen's Choice, Plumb's Cider, Haas, Snow, Malinda, etc.; it survived the winter of 1884-'85 in many instances and is doing well, but I could not recommend it for general planting. The best crabs and hybrids for general cultivation are the Virginia, Martha, Early Strawberry, Minnesota, Whitney and Briar Sweet.

Plums.—Desota, Forest Garden, Wolf and Miner. The Weaver is very fine in some places, while in others it is ruined by the curculio. The Miner does well on its own roots. The Rollingsstone promises well, so also do many others which will become prominent before long. The tree agent is not dead yet.

Grapes.—Concord, Worden, Delaware, Moore's Early, Janesville and Agawam.

Raspberries.—Red—Turner, Marlboro, Shaffer's Colossal; Black—Souhegan and Gregg.

Blackberries.—Ancient Briton and Snyder.

Currants.—Stewart's, Long Bunch Holland, Victoria, Red Dutch and White Grape.

Gooseberries.—Houghton and Downing.

Strawberries.—Crescent, Warfield, Haverland, Bederwood, Lovett's Early, Capt. Jack and Glendale. Parker Earle and Michael's Early seem to be a success on moist clay soil.

FIFTH CONGRESSIONAL DISTRICT.

JOHN H. STEVENS, VICE-PRESIDENT, MINNEAPOLIS.

This district is composed of only one county, that of Hennepin; hence, the territory is very small when compared with any of the other congressional districts of the state; yet it is the parent of Minnesota horticulture. The reason of this is because of its early occupation by the whites. It is nearly fifty years since I have, off and on, been a resident within its boundaries, and a half a century has caused a great change in the condition of everything that pertains to the products of the soil. At that early period apples had been successfully grown for a brief period by that noble pioneer missionary, Gideon H. Pond, on the mission grounds at Oak Grove, in what is now Hennepin county. The territory embraced in this district has given out to the world many choice varieties of fruit. It is the home of the Wealthy and numerous other seedling apples, the handiwork of the grand old pomologist, Peter M. Gideon. Here, too, our ever respected pioneer cotemporary, Amasa Stewart, long since a resident of Texas, introduced Stewart's Seedling currant, and Stewart's Seedling apple, and here, too, our former good collaborer, Geo. S. Woolsey, originated two varieties of strawberries, fit delicacies to be set before the most particular epicure. Mr. Woolsey emigrated to California; I doubt not he wishes he was back here to introduce more new varieties of fruit. Wyman Elliot and M. Pearce, who are with us today, have contributed to the list of new varieties of luxuries in the fruit line; so have others that I have not time to speak of, but still the good work is going on.

The season of 1895 has hardly produced an average crop of fruit in this district. The early part was favorable, but subsequently the want of humidity, last and this year, damaged our strawberry, raspberry and blackberry products at least 50 per cent. While currants and gooseberries were not a failure, the crop was small. The yield of grapes was more satisfactory, but hardly as large as indicated earlier in the season. The harvest of plums, both tame and wild, was the best in years—thus showing that the yield of that fruit is not, as many have said, "a thing of the past." And apples, a fair yield, in favorable localities a large one. The more discouragement in the propagation of the apple, the more perseverance is observed by those engaged in its cultivation. No one for a moment doubts but what in the near future several varieties can be grown with profit—for that matter they are now.

No cherries of moment are in cultivation; neither is there a probability that there will be for some time to come, though we may expect good results from some of the Russian varieties to a greater or less extent.

Large quantities of fruit of every variety have been shipped into this district the past season from the four corners of the Union, which has been sold at moderate prices. The introduction of so much fruit from other states has a depressing effect on our home products. For instance: strawberries were sold in our market during the months of April and May and the early part of June, from ten to fifteen cents per quart. Of course, the quality was not so good as those of Minnesota growth, but the tendency was the same; it reduced the price of the Minnesota berry; it brought us in competition with those outside of the state.

A great and growing industry in this neighborhood is the "market garden;" the price of the product from this industry the past year has, I regret to say, ruled low. Minneapolis is now a city of near 200,000; of the county, 218,000; hence, large quantities of vegetables as well as fruit are necessary for the people. The yield of the garden, as to every variety of vegetables grown, was fully up to the average.

All in all, the horticulturists of this district are far from being discouraged; on the other hand, their prospects are bright.

SIXTH CONGRESSIONAL DISTRICT.

J. O. BARRETT, VICE-PRESIDENT, BROWN'S VALLEY.

The district I represent is probably the most difficult in the state for raising fruit plants. It comprises the northwestern division of the state, mostly prairie and treeless and, therefore, exposed to our destructive winds. The facts gleaned from various environments show that the late frosts of last May, extending over a large portion of our entire country, greatly injured the fruit plants. I know of no better antidote for such fatality than the liberal use of the smudge, choking "jack frost" with smoke.

Owing to early and late frosts, plum raising with us is precarious. Where such trees are on high ground, protected against winds, we

do measurably succeed despite the atmospheric chill, more especially with the indigenous and the hardier sorts of cultivated plums, such as the Desota and Forest Garden.

Raising apples and crabs does not indicate any special encouragement, though success here and there obtains on a limited scale. The general testimony, based in experience, is that the trees must be planted on high and properly drained ground, protected by forest trees quite distant from the orchard, just enough to stay the winds and yet allow free circulation of air. The reports to me are generally adverse. One of my correspondents, Mr. E. H. Bailey, Wilkins county—all prairie and mostly treeless—says: "If there is a good apple tree *really* adapted to this locality, I should like to know it." Another intelligent gentleman, of Grant county—partly wooded but largely treeless—says: "A large number of crabs were planted fifteen or twenty years ago and for a time bore excellent crops, but they have now nearly all died out. No success has ever been attained with larger apples. We have now a few Duchess that look thriftier than any we had, but they have not yet stood the test of the winter."

Reports from the Red River Valley are about on the same key, but some experiments are hopeful enough to demonstrate by example that apples—crabs mainly—can be raised there quite extensively, when the trees coming in healthy condition and judiciously selected are rightly managed. A lover of forest trees and fruit plants, Mr. O. J. Hagen, of Hendrum, Norman county, says: "Very little attention is paid to fruit raising in all this region." Experimenting largely with choice sorts recommended, he mentions the Duchess, Charlamoff, Anis, Virginia, Early Strawberry, Martha, Tonka and Lieby as promising trees, and is waiting to see how the Wealthy, Whitney, Red Siberian and some others will turn out. He maintains that the large percentage of alkali in the soil of the valley is a greater hindrance to success than the climate and that the choice of land for any fruit plant should be very select.

Rev. O. A. Th. Solem, of Halstad, Norman county, is an ardent lover of forest trees and fruit plants and has had large experience and observations on these lines in his part of the Red River Valley. He reports the old Houghton gooseberry as a good bearer, but too small for a tame variety; and the Turner raspberry as very hardy with him, but puckers badly and dries its berries on the cones; but the Souhegan is the best black-cap raspberry, and the most promising currants in that northern belt are the Victoria, Prince Albert, White and Red Dutch and Black Naples; that owing to the May frost and "heavy snow earthstorms," crops of small fruits were meager and no strawberries. He also reports that his apples and crab trees, the Lieby, Charlamoff, Arctic and Tonka, especially, are promising stock with him.

So eager are our people to have cherries that young folks rummage all the lake and river shores for our common choke cherries. The sand cherry adapts itself to all our varieties of soil and, as it deserves, is growing in public favor as a good berry, but not the best we ought to raise.

A summary of the fruit raising in the sixth district dating in reports to me, is that apples and crabs are yet on trial, that among small fruits the currants and sand cherry leads, gooseberries next, raspberries next, blackberries next. The most delicious of them all, the strawberry, has to take the rear for reliability. The ill success in raising this berry is, as a rule, from neglect to attend to its needs. In the estimation of the average farmer, strawberries are too small fry to stoop to; will do for women, etc. Yes, and women show better sense, and are more patient with the precious little plants that do indeed respond to tenderer hands. Everywhere with us the question is asked, "Why do they not yield more?" Even when put in rich soil, creditably cultivated, winter mulched, the crops are meager compared with those in the southern part of the state. As they generally blossom profusely, the inference is that they are not well pollenized. The winds are sometimes helpful but are more frequently hindrances, for they blow the pollen from the beds. Nor does the protection of trees bring the fruit we are entitled to.

To a great extent I attribute our failures in profitable fruit raising to a lack of bees and other honey-eating insects. We make poor headway raising the clovers, because we have not the bees to fertilize them, and we have a superabundance of field mice that destroy the combs and nests of the bees, and we have not old maids enough to raise cats enough to destroy the field mice, and we have so many fool farmers who struggle to farm it on the prairie without forests to break the winds, bees stay away from us because we build no tree homes for them to live in and get honey from. And so we plod along with "wheat on the brain" and wild buffalo grass seed in the hair, pocketless, because beeless, and beeless because treeless and cloverless, and fruitless because faithless in diversified agriculture. Success in fruit raising lies in restoring the interlinks in the life chain of being, broken by deforestation and burning over the country we are trying to domesticate. Darwin well says: "So profound is our ignorance, and so high our presumption, that all marvel when we hear of the extinction of an organic being; and as we do not see the cause, we invoke cataclysms to desolate the world or invent laws on the duration of the forms of life!"

SEVENTH CONGRESSIONAL DISTRICT.

MRS. JENNIE STAGER, VICE-PRESIDENT, SAUK RAPIDS.

Mr. President, ladies and gentlemen:—The past season has been the worst for small fruits we have had for years, owing to the hard and successive frosts just when the fruits were blossoming. Strawberry plants were frozen out, raspberries killed down to the ground and almost all other fruit hurt in a measure. Still I do not think the damage would have been so great were it not for the drought of the summer before, which must have weakened the plants. However, a failure now and then does not discourage us, as I find more small fruit has been planted in our district this year than ever before.

Currants and gooseberries were quite plentiful and very large, as the frost thinned them to advantage. Grapes also did quite well, but up here we keep them partly covered until danger from late frosts is over. Several people here have raised some fine large apples this summer (1895). So far I cannot recommend any particular apple for this section, as it needs more time to judge. Of named plums, Desota and Weaver have proved hardy and good here, and if apples prove a failure we can always sell enough plums to buy the former fruit. Wild plums are plentiful here, some quite fine, but this year even they were a failure. Every one should plant a few grape vines. Brighton and Worden, with Concord for fertilizer, will generally give a good crop, and if the Concord does not always ripen, why they need only be half ripe to make delicious jelly and preserves. Then one or two hundred strawberry plants, Crescent, Bederwood and Warfield, will provide many a luscious dish for the family—and a hundred Cuthberts and the same number of Gregg raspberries.

Of course, I need not mention currants and gooseberries, as most every garden has them. They will help the wife and mother out nicely with her bill of fare. I suppose you all know that Sauk Rapids is having a boom, and we expect before long to rival Minneapolis, not only as a city but as a fruit center, and we may *then* hope to entertain the members of the society, if not before; and our great ambition will be to give you, if possible, as pleasant a time as we had last year at Lake City.

Mrs. Stager: I want to speak about some seedling apples. Some years ago Peter Gideon sent me several hundred apple trees and some other seedling trees. I gave them to one of my neighbors, who planted them, and last year he fruited some twenty trees. They were very nice apples, and I sent a box to Professor Green. One of the seedling plums was the largest I ever saw. I saw some large ones at the fair, but they did not come up to mine. This year they were larger than ever. I sent some of them to Professor Green, but they were spoiled when they got there; I suppose it was because they were so long in reaching him.



**CAPT. J. N. CROSS' FORESTRY PLAN AND COMMENTS
BY PROF. B. E. FERNOW.**

Some time since a copy of the subjoined circular was sent to Prof. B. E. Fernow, Chief of the Division of Forestry, Department of Agriculture—as also to a large number of other persons—for examination and comment. The response of Prof. Fernow to this circular and a personal communication, is of sufficient interest to be worthy of publication, and it is given below in full, preceded by the circular letter as necessary to a full understanding of it. This letter was in the possession of Capt. Cross at our late summer meeting, but on account of lack time it was not presented.

SECRETARY.

(CIRCULAR.)

TO FRIENDS OF FORESTRY.

At the late annual meeting of the Minnesota State Forestry Association, the following proposition was submitted to it for consideration, with the result that a committee was appointed to carefully consider the plan proposed and report its conclusions to the executive committee of the association as early as practicable. The proposition being novel, important and with far-reaching possibilities, the committee is conscious of the weighty responsibility devolving upon it, and therefore earnestly requests expressions of opinion from the active friends of forestry in the state upon the matter. It is hoped by the committee, therefore, that the proposition will be carefully considered by each one who receives a copy of this, and that his opinion, with reasons for it, will be forwarded to the secretary of the association at his earliest convenience. The forestry problem in Minnesota is pressing for solution, and no further time should be lost in adopting measures calculated to preserve and restore large forest areas in the woodland and prairie portions of the state.

Address all communications to J. O. BARRETT, Secretary, Brown's Valley, Minnesota; S. M. OWEN, President, Minneapolis.

PLAN FOR THE STATE TO ACQUIRE A FORESTRY AREA.

The following is a synopsis of the plan proposed by Judson N. Cross, of Minneapolis, Minnesota, to the State Forestry Association of Minnesota at its annual meeting held at Minneapolis, January 15th, 1896, for the state to acquire quickly and without expense the beginnings of a forestry area.

FIRST:—That the legislature constitute state, county and town forestry boards; for economy the town boards of supervisors to constitute the town forestry boards, the county commissioners to constitute the county forestry boards, and the state forestry board to consist of nine members, as follows, to-wit:

1st:—The state land commissioner to be chairman, and representing the state lands and the forest fire warden department.

2d:—The person occupying the chair of horticulture (at present including arboriculture) in the agricultural department of the state university, and representing the Minnesota State Horticultural Society.

3rd:—The person having in charge the Minnesota section of the climate and crop service of the United States weather bureau.

One member chosen by each of the following boards or associations from their own members: 4th, state forestry association; 5th, farmer's institute; 6th, board of regents of the university; 7th, state lumberman's association; 8th, board of public health; 9th, fish and game commissioners.

All to serve without pay, except actual expenses. An executive committee of three to be selected by the state board.

SECOND:—That owners of cut-over pine lands or other lands, especially rough, rocky and sandy lands, which will probably not be utilized for many years for agricultural lands, when recommended by the town and county forestry boards, (the authority and work of each board to be designated by the legislature) may deed the same to the state (reserving minerals, oils, coals and mineral paints with the right to hunt for, dig, mine and carry away the same) for forestry purposes; and when so deeded the same shall be exempt from taxes because dedicated to public purposes. Such lands may be so deeded subject to taxes, tax forfeiture and tax sales.

THIRD:—The state forestry board shall take charge of all such lands, to be designated as the "Reserved Forest Area," and care for the same as the legislature may direct. Appeals may be taken from the decisions of the town and county boards of forestry, either by the person offering to deed the land or an inhabitant and property owner of the county, to the state forestry board, whose decision shall be final.

FOURTH:—The future incomes derived from such lands from whatever source shall be divided into thirds and distributed as follows, to-wit:

(a) The state shall have one-third of such income to reimburse it and the towns and counties where situated for care and protection of the land and loss of taxes, $\frac{1}{4}$ to go to the state, $\frac{1}{4}$ to the town and $\frac{1}{2}$ to the county.

(b) The person so deeding the land and his heirs (to be made inalienable if he so elect) or assigns to have one-third of such income for the first seventy-five or one hundred years, after that time to go to the educational institution which he may designate to have the other third of such income.

(c) The other third of the income to go to such educational institution or system in the state, private, public or denominational, as the donor may designate in the deed of conveyance or in a separate instrument executed as deeds are required to be executed and recorded as deeds are recorded in the county where the lands lie, or by will. In case the donor fails to so designate such institution or system, or if for any reason such institution or system fails to exist, then the same to go, one-fourth to the state university and three-fourths to the public schools of the state.

FIFTH:—The state shall have full power to lease for revenue or for protection from fire or trespassers low meadow tracts, or for pasture where it would not interfere with the growth of the forest trees, and to sell dead and down timber, which, as the adjoining lands are settled, will in the near future aggregate a large income; and generally the state must have full power of control, even the power of alienation of certain tracts when recommended by the state board of forestry, as where the growth of towns, the building of railroads, water powers, etc., may necessitate alienation; the proceeds of sale to be distributed as are the proceeds of the product of the forest area.

COMMENTS OF PROF. B. E. FERNOW.

"In answer to your specific question, I will state that I know of no legislation in existence which covers precisely such a case as you have in hand. The nearest approach to it is a clause in the law creating the New Hampshire Forest Commission in 1893, which empowers that commission to receive donations in lands or money towards the establishment of a state park or forest reserve, but, as far as I know, no particular method or condition is prescribed nor has anything resulted from it."

Extract from New Hampshire Forestry Law, (Session of 1893), p. 142.

"Sec. 4. Whenever any person or persons shall supply the necessary funds therefor, so that no cost or expense shall accrue to the state, the forestry commission is hereby authorized to buy any tract of land and devote the same to the purpose of a public park. If they cannot agree with the owners thereof as to the price, they may condemn the same under the powers of eminent domain, and the value shall be determined as in the case of lands taken for highways, with the same rights of appeal and jury trial. On the payment of the value as finally determined, the land so taken shall be vested in the state and forever held for the purposes of a public park. The persons furnishing the money to buy such land shall be at liberty to lay out such roads and paths on the land and otherwise improve the same under the direction of the forestry commission, and the tract shall at all times be open to the use of the public."

(Evidently the above law was devised solely to assist some parties to acquire, by aid of the state's eminent domain, a hunting park. It has not the ring of an earnest effort to establish a state forest reserve. There is no *incentive* held out for donations to the state of non-agricultural lands as a beginning for systematic forestry, as is proposed by the foregoing plan for Minnesota.

If private owners are to be appealed to, in order to save the state the expense of acquiring a forestry reserve, some such *incentive* must be held out as is proposed by Mr. Cross.)

"I confess that in the absence of more intimate knowledge of the existing organization of your state institutions, my ideas on your plan can be only crude and of a general character. I may, however, suggest the following:

"1. Create a board of trustees to receive the lands and to act as a board of control after the lands have been turned over to the administrative body to be mentioned later on. You may remember that in the state of Massachusetts there exists since 1891 such a board of trustees, whose function it is to receive donations not only for the state but also for any cities, villages or municipalities, and hold them until they can be turned over to the properly constituted state or city commission.

"This board, I consider, should be composed in part or entirely of persons holding positions ex-officio. A good composition might be the governor, the auditor, the president of the regents of the university, the judges of the forested districts in which the donated lands would be located, the justices of the supreme court or of any one and, perhaps, three prominent citizens interested in this matter.

"2. Create independently of this board of trustees an administrative board, in part also to be constituted of members ex-officio, in part of other appointments. For instance, the surveyor-general, the fire commissioner, an appointee of the state forestry association and two appointees of the governor might be a proper composition. This board would have to formulate the plans for the administration and supervise this administration, with a paid executive officer, or state forestry staff, who is not appointed by the board; but I am in doubt as to how his appointment could best be secured. The plans for administration should be submitted to the board of trustees for sanction in general, and also the report of the administrative board. In this way I expect to secure a much more general interest in the proceedings and have a wholesome check and control of the administration.

"3. I should think that it would be undesirable and inconvenient to separate the administration of the donated lands from that of the state lands; not knowing how the present administration of such lands is constituted, I am unable to suggest how, with the least friction, a change might be made. I would not burden the fire commissioner with the executive duty in administering the lands except as a member of the board; otherwise, keep him separate, looking after his business.

"4. The co-operation with state troops in case of emergency is, I imagine, provided for by general law, protection of public property being especially one of the functions; but it might be well to provide for a more definite and easy use of this agency. I would advise that in your proposed bill the manner of administration be decided upon only in general terms, showing the general object aimed at, but that the technical details be left as much as possible to be formulated by the board.

"These suggestions are thrust out for what they may be worth to you in opening possibilities. There are, of course, many other ways of organizing such a matter in order to be successful; a leaning onto the existing organization may suggest entirely different procedure. The main thing to be considered is that a mutual check be secured by the manner of combining and organizing the various boards. If you secure at least the board of trustees to receive and hold the lands for the state, the further elaboration might perhaps come in time, just as the municipal park system of Boston was, in part, an outgrowth of the possibilities provided by the board of trustees.

"I consider the division of responsibilities between a board of trustees and an administrative board most desirable but would add that finally, one well paid man who has no other business to attend to, a general secretary, possibly acting for both boards, will accom-

plish more results than if all is left to be done by an unpaid board.

"The failure of government administration is due generally to two causes which would wreck any private enterprise, absence of proper control and reliance upon unpaid, cheap and unskilled employees. Seek to avoid these two errors in this new state enterprise, and you will be reasonably successful.

"As for the division of the gross income, it appears to me somewhat unfair, since it seems to be supposed that the cost of management and loss of taxes will be covered by one-third of the income. This I have good reasons to doubt. It would be fairer if the division were made of the net income after cost of management is deducted, and then to be only in two parts, namely, to the original owner and to the state or, better, the town or county. There is one argument which undoubtedly will arise against the proposed forest reservations, and not without some force by adjoining settlers, and which should be met at the outset by taking off its edge. If large contiguous bodies are reserved, not only extension of settlement is stopped, which possibly the character of the reserved lands would forbid anyhow, but the existing settlements become more isolated and the burden of maintaining schoolhouses, churches and roads becomes naturally greater; and although finally the forest reservations if placed under proper management become sources of advantage in affording employment in winter time, etc., the disadvantages mentioned will for a time at least be greater. Hence, it is but fair to compensate the towns or counties by turning over to them a part of the proceeds of the forest management. In this way the forest reservations may become not only indirectly but directly desirable to these settlers in reducing the burden of taxation and make them favorably inclined to their establishment.

"I suppose the proposition to have a designated educational institution benefited by participation in the proceeds was to give additional incentive to would-be donors. I believe, however, that the incentive would be just as great, the conditions less cumbersome, the justice greater and the very desirable interest of the town or county authorities, in fact, of all the citizens, increased in the success of the administration of these lands, if the latter have the disposal of this fund. To retain the educational idea, it might be ordered that the fund so acquired be only used for educational purposes.

"Otherwise I am in full accord with the general spirit of the proposition and would only add regarding the management of the lands after they have come into the control of the state, that confidence of would-be donors in the probability of a wise administration will be their greatest incentive, and such an administration can only be had by applying business principles and technical knowledge. Hence, besides the secretary with legal training, who would transact the routine business of the boards in effecting the transfer of lands to them and their administration, a technical manager of the lands, a lumberman with more than ordinary knowledge and skill, must be employed to apply forestry principles and secure the pecuniary and other results expected from this forest management. He, too, will have to be a well paid man. To carry on a business on

business principles requires a business man, and a competent business manager will not be easily induced to accept a state position which does not bring him an equivalent income to what he can earn in private business.

"The plan of having the state control large forest areas, managed less with a view to largest money returns but to continuity and permanently favorable conditions, is the only promising one, as every European state has finally found out. It is reasonable that the private owner can only be expected to look after the greatest immediate money returns on his investment, while the state, the community alone, being long lived and permanent, can wait for profits, can manage with other views than the pocket, can consider the beneficial influences upon climate, waterflow and general cultural conditions, which a forest area exerts."

(Comments and suggestions on this subject are requested from any who are interested. SEC'Y.)

A DELAWARE VINEYARD.

C. W. SAMPSON, EUREKA.

In order to have a successful Delaware vineyard, you must, in the first place, have the right kind of soil and the right kind of location. I consider the location the most important in the raising of the Delaware grape. In this state you should locate your vineyard on or near a lake or other body of water. The reason for this is that the water in the lake will remain warm while the atmosphere is cold enough to freeze, and by locating the vineyard on the south or east of the lake the cold north wind will blow this warm vapor over your vineyard and protect it from the frost, both in late spring and early fall. The severe frosts we had this last spring did not injure my vines in the least.

I consider the best soil for the Delaware grape in this state to be a sandy loam, with a heavy clay sub-soil containing a considerable amount of lime. In preparing the ground for a vineyard, I would plow very deep and pulverize well. Then I would mark off the ground and plant the vines 8x8 feet, always running the rows cross-wise of the hill to prevent washing. In setting the vines, I use a spade to make the holes, which are about one foot deep, one end slanting. I prefer good, strong one year vines, and I place them in a slanting position in the hole, so that the vine will easily lay to the ground. I train them in that way, and we have no difficulty in laying them down and covering with dirt in the fall. The first year I set a pole about six feet high, which I allow the vine to run up. I allow only one bud to grow. In the fall I cut back to three buds and cover well with dirt, and if the ground has been kept clean from weeds I put a small forkful of straw or hay over the roots to keep them from killing the first winter. This I consider very important.

The second year I put in my posts and at least one wire, which I train the vines along, allowing only one vine to grow. In the fall I have from two to three feet of vine, and each year lengthen out the

vine according as the vine has ripened its wood. The third year we should have a good strong vine eight feet long and capable of producing eight or ten pounds of grapes. I use three wires for a trellis, and tie the vine to the bottom wire, training the new shoots upright, about four inches apart. When the shoots have grown six inches above the top wire, I pinch the end off and keep doing so until August first, when I let them grow. I also pull out any laterals that may grow out as far up as the grapes grow. This is to prevent too much wood and to keep the clusters from being tangled. When the vines have reached maturity, I allow them to bear from ten to fifteen pounds of grapes, for which I find a ready market in our Twin Cities at five cents per pound. A good Delaware vineyard will clear a net profit of about \$100 per acre.

I find all the work connected with a vineyard very easy and pleasant, and think I would prefer raising grapes to small fruit. I consider spraying with the Bordeaux mixture very important to prevent mildew and keep the vines in a healthy condition. To destroy the leaf-hopper, I use fine air-slaked lime, and I sprinkle it among the vines when the dew is on early in the morning. I find this the best remedy, and I have tried a good many.

DISCUSSION.

Mr. A. H. Brackett: What success did you have with the air-slaked lime in driving away the leaf-hoppers?

Mr. Sampson: I had the best success with it; it certainly drives them away. The dust seems to choke them and drive them away.

Pres. Underwood: Are there any other remarks to be made on this subject of grapes?

Mr. Wyman Elliot: Which is of the most value as between the Concord and Delaware in this climate so far as profit is concerned?

Mr. Sampson: In my experience, I found the Delaware the more profitable. The Delaware is not shipped to our market to any extent, while the Concord is shipped here by the car-load from New York and Illinois and sells very cheap. A few years ago we could get very good prices, but now we can get very little more than Eastern grapes are sold for.

Mr. C. Wedge: What do you get for Delawares?

Mr. Sampson: They average us about five cents per pound.

Mr. G. J. Kellogg: You get the price pretty low.

Mr. Sampson: Yes, I put it pretty low.

Secy. Latham: There is another reason why the Delaware is more profitable; it is not so much trouble to take care of them in the summer. They have a tendency of clinging to each other, and with a very little tying they cling to each

other, while the Concords have to be tied every time. In pruning the vines there is almost the same difference. The Delaware can be pruned to spurs, and it is almost certain that the buds are fruit buds, while if the Concord were similarly pruned you would not get much fruit.

Mr. C. L. Smith: You do not have to haul so many grapes to market.

Mr. E. J. Cutts: It is considered a fact among dealers that Minnesota Delawares are superior to anything raised in the United States.

Mr. Jacques: I had a friend from New York visiting me, and as we always have grapes in the house, he had an opportunity to eat some, and he made the remark that he had never seen any grapes before.

Secy. Latham: I can say that at the World's Fair the judges on grapes stated they had never seen such Concords and Delawares as came from Minnesota, and they stated the Minnesota grapes were ahead of anything in the United States.

Mr. Cutts: Has any one had much experience with the renewal system? A vine when it becomes old is very hard to lay down.

Mr. Sampson: I find it is a very good plan, where you can, to get a shoot right from the root. The second year you will find it will bear nearly as much as the old vine.

Mr. Cutts: The trouble seems to be that the old vines will not put out any shoots.

Mr. Smith: Girdle the old vines.

Secy. Latham: I have never had much trouble. Almost always you can get a cane pretty well back near the ground, near enough for all practical purposes. Renewing is very necessary if you have many vacant places on the old vine, and in renewing you can go back and cover all the vacant places. If I had a vine in bad shape and no shoots coming out from near the ground, I think I should try girdling it.

Mr. Smith: Just put a wire around it, that will answer the purpose.

Mr. Cutts: Mr. Sampson spoke about Delawares being planted eight feet apart each way. A good many recommend to plant them six feet each way.

Secy. Latham: There is a great deal of room wasted in a vineyard. My oldest vineyard is planted in rows six feet apart and the vines eight feet apart in the row. I never had

any vineyard bear any more, and it continues to bear. The exhibit of Mr. Loudon, in the other room, is taken from that vineyard. The vines do not seem to be too near. The only difficulty is there is not earth enough to cover them. My latest experience is in planting them seven feet apart each way. A vine seven feet long is also easier to handle.

STRAWBERRIES.

H. BOVEE, CARLTON, MINN.

I can remember when there was no such thing as growing berries for market, but it has become a very profitable business in this country. The first I remember was of people growing a few in their gardens of the Early Scarlet berry, about like the wild berry, small and soft. Then came Harvey's Seedling, a good berry, then the grand old Wilson, which is the finest berry today that we have, then the Crescent, the most productive we have now, and we have different kinds by the thousand. I think the Warfield is the best market berry we have; they are of a good size, of firm, dark, rich color (crimson) and *look well* in the box. I shipped some to Livingston, Mont., and they wrote me that they received them in good condition. We have twenty acres in bearing and are testing many varieties on which I will report later. We are using the Warfield and think it has come to stay; Wilson we use to fertilize the Warfield.

This is the best location for the berry business I have ever seen. The soil is a clay loam, half clay and half sand, a natural berry soil. Our shipping facilities cannot be excelled—two roads, St. Paul & Duluth and Northern Pacific. Our berries are on the market from one to two hours after picking, selling from seventeen to twenty cents a quart by the case. The reason of that is this: when our berries are ripe there are no berries for sale anywhere, so we have full control of the market. Dealers retail them at twenty-five cents a quart. It costs five cents a quart to grow, pick and market strawberries. They can be grown as cheaply as potatoes and as many bushels to the acre. Potatoes sell for fifty cents a bushel and berries for over five dollars per bushel. I think the prospect for berry culture here is big. We have St. Paul, Duluth and Minneapolis for markets. This may surprise you, but I sent berries to Yerxa's in St. Paul, and they gave me fifteen cents per quart and wanted all we could send them. They had been selling berries from five to ten cents during the berry season, for my daughter told me she had bought strawberries of them for five cents per quart during the berry season.

It is astonishing that farmers do not have berries in plenty. If they will set out one-quarter acre of Crescent plants and keep them well hoed the first season, I will warrant them plenty of berries for three seasons; I say Crescents because they will stand more neglect than any other berry and will grow a good crop under any and all conditions.

I will give you a rule to find the number of plants you want for any given piece of land. There are 43,560 square feet in one acre; now multiply the distance between the row, by the distance between the plants in the row and use that as a divisor for the 43,560 and you will have the number of plants for one acre—or any piece of land the same way by taking the number of square feet in the piece.

I have great trouble in getting plants from nurserymen in good condition—the plants come packed in wet moss, which heats and spoils them. I have had them come so hot, I could not hold my hand in them. I will give you a plan of my own for sending plants. Take a common market basket, put one inch of soil in the bottom; put in the plants, roots in the soil, and set the basket in a tub with two inches of water for five minutes and then take out. The soil keeps them cool and moist and gives them nourishment, and you can carry them all over the world if you set them in two inches of water once a week. I carried two baskets to Centralia, Wash., and stopped two weeks in Missoula, and when I got to my destination I set the plants out and did not lose one plant. This was in the fall in November.

I will give you a good rule for setting plants: Take a piece of sawblade and make a scoop about as big as your hand, then fasten a wooden handle to it. Run the blade of the scoop on one side about three inches from the plant, then on the other, then you can take up the plant without disturbing the root much; make a hole in the soil where you wish to set your plant, put it in with the soil firmly around it, being careful to not cover the crown, and you cannot tell that it has ever been moved or its growth prevented for a moment.

In packing and marketing berries, have your boxes full quarts and clean; do not put small berries on the bottom and large ones on top. Keep them out of the sun. Fill the boxes rounding full. I never have found a quart cup that would hold the berries in a box filled in that way. In that way you show the people you are doing an honest business.

THE CROZY CANNA.—I received a small growing plant of it two summers ago. It was too early to set it in the open ground, so I potted it, and when the season was sufficiently advanced it was bedded out and grew—how it did grow!—and bloomed all summer. Just before cold weather came on, I took it up very carefully, gave it a paint keg for a home, with rich soil to live in, and after a short interval it bloomed again, continuing to do so all winter. In the spring, I took it from the keg, cut it all to pieces, gave away several and kept two large clumps myself. Owing to the dry weather it did not do so well as before, though it was not entirely without bloom at any time during the summer. In the fall, I put one of the clumps in the cellar, where it lay all winter, apparently a lump of dry earth. About the first of May, I divided it again, this time in three parts, two of which I gave away, and the third piece I placed in the center of a circular geranium bed, where it now promises to do great things; the other I potted in the autumn and have enjoyed the beauty of its rich bloom in the house when other flowers were not very plentiful.—*Western Gardener*.

OUR PROGRAM.

[Discussion at last Annual Meeting.]

Question Box:—"What kind of a program do our members like best?"

Mr. J. S. Harris: One that will make us work to finish it up.

Pres. Underwood: The making of the program is always left to the executive committee. The thought in this question is to allow the members an opportunity to express themselves as to whether they like a good many papers read, or less papers and more discussions. The executive committee would be glad to have an expression from members on this question. The members need not be at all afraid to express themselves for fear of hurting the feelings of the executive committee. I am sure they would be glad to receive any suggestions.

Mr. Collman, (Iowa): In our country the president usually arranges the program for the next meeting, and while I held that position I had that to do, and I found it quite a task. I realized that most of our members were no longer young, that they were on the down hill side of life, and that we needed young blood in our society; so I wrote to our agricultural college and asked them if they had some bright young ladies and young men there. I told them I wanted some of the best young ladies and young men to take part in our meeting. They replied, "They all will be willing to help you if you just ask them." So I asked several of the young ladies, and some gave us a paper and some a declamation and some one thing and some another, and I have heard many say it was the best meeting we ever had. The reason I thought it would be nice to have the young people take part, we are having better schools now, and our young people are better posted than we are, and you will find it so in your state. I do not want to criticize at all, and if I were to offer any it would be because you have no young people on your program.

Mr Harris: It is my opinion that I wrote the secretary to that effect before this meeting, that it would be one of the best drawing cards we could get up to have a whole session, afternoon and evening, occupied entirely by young people from sixteen to twenty-four years old—to have some essays, papers, etc., read by people of those ages. I think we had better try this summer to see if we cannot work it up.

Pres. Underwood: When the present program was submitted to me I suggested to our secretary and to Professor Green that the school of horticulture and agriculture furnish at least one part of the program, but for some reason it was thought best not to make an arrangement of that kind. However, I think it would have been interesting to have done so.

Mr. Kellogg, (Wisconsin): I do not agree with friend Harris on one point. His idea is to have the young people take part all at one session. I would want to have them interspersed all through the session. I think there are enough students to enliven all the sessions, and I certainly believe in the young ladies.

Mr. Harris: Yes, we know that. (Laughter).

ORCHIDS IN A MINNESOTA GREENHOUSE.

R. S. MACKINTOSH, ST. ANTHONY PARK.

The accompanying picture was taken last March in Mr. R. J. Mendenhall's greenhouse on the day that Professor Green's class in greenhouse work, from the agricultural school, visited it. It illustrates very well the beautiful orchids (*Cattelya*) which were in bloom at that time. The other houses were equally as beautiful as this one. A large sale of violets was in progress the day that we were there. This visit was an object lesson to the students as to the extent of the flower business in this section.

On a previous trip they inspected Mr. Fred Busch's extensive vegetable forcing greenhouse in Richfield, where they saw large quantities of nice vegetables growing during the winter.

Both Mr. Mendenhall and Mr. Busch are always ready to show the boys through their greenhouses and to answer any questions that are asked them.

These excursions are of great benefit to the class in illustrating the practical working of the various subjects upon which they are engaged in the class room.

PLUMS A SOURCE OF PROFIT.

DEWAIN COOK, WINDOM.

We are satisfied that there is no place in Minnesota where the European, or what is commonly called the tame plum, can be profitably grown, and, even if they could be grown here, we have no use for them, as we have a better fruit in our best selected natives. In that section of country which lies between Lake Michigan and the Missouri river, the finest varieties are found growing wild most everywhere, and I believe that all the hardy natives now prominently before the public originated in this same territory—and we of Minnesota are living in the center of the best native plum region upon earth. Three of the best eating plums known, the Rollingsstone, Mankato and Ocheeda, originated within our borders. With the common wild plum so plentiful, probably not in one town in twenty in our state could a bushel of any of our standard varieties be obtained in their season. I have been unable to even supply the local demand at \$2.00 per bushel. That price or more could no doubt be obtained anywhere in our state. What an opening! No winter killing, no blight and a ready market at good prices!

But we have the plum gouger and the curculio with us always, and for profit we should plant mostly of the thick skinned varieties, like the Wolf and the Mankato, as they seem to be stung less and recover more rapidly than the thin skinned varieties, like the Cheney and the Rockford.

The Desota on account of its early and sure fruiting and good quality should, of course, be one of the varieties most largely grown. The Rollingsstone is one of the best sellers whenever its qualities become known. The Hawkeye and Stoddard should no doubt be included in the list of plums to plant for profit.

For home use, it is, of course, profitable to plant even as few as one or two trees, but as the market is practically unlimited, the greater the number of trees cared for the greater the profit.

ORCHIDS IN BLOOM IN THE WEEKENDUALLY GREENHOUSES.

THE LAWN.

Nothing contributes more to the beauty of a place than a well kept lawn, and every person who aims to make home attractive should give this matter considerable attention. A perfect lawn, such as one may see on Euclid Avenue, in Cleveland, is obtained at heavy expense, but, fortunately for us, a very good substitute is within the reach of nearly every one. Here, in northern Ohio, grass seems to be nature's covering for the soil. Any place left to itself will come into grass or white clover, but it is not best to depend solely on nature.

It is better to prepare the soil and sow the seed. If the plot to be seeded is a small one so that it can not be plowed, it should be spaded deeply, and the good soil turned under. Great care will be required to get the surface even. Any parts that are too high must be lowered, and the surplus earth carried to the points where it is most needed. In filling up low places the soil should be tramped thoroughly so that when all is settled it may still present an even surface.

After the grading is completed, the surface should be enriched with whatever fertilizer is most convenient. There is nothing better than old, rotted manure. Bonedust and wood ashes will answer. After the ground is graded and enriched—and there is no better time for this than early spring—a lawn may be had at once by sodding, but this is expensive.

A very reliable method, and yet not a costly one, is to get a quantity of sod and cut it into pieces about three inches square and place them a foot apart all over the surface, and press them into the ground. They will commence to grow at once and soon run together if the ground be moist enough.

The common way is to sow grass seed quite thickly, rake it in and then roll the surface. If this be done in the early spring, it is usually a success. Later in the season when the weather is dry and hot, the conditions are less favorable. At such a time it is a good plan to cover the surface lightly with straw to shade the ground until the seed is coming up.

For this climate there is nothing better than Kentucky blue grass. Redtop is nearly as good. The mixtures sold under the names of lawn grass are probably all good, but often too costly. The writer has made many a good lawn by simply using the seed found under the hay in the barn. The important thing is to use enough.

While a thorough preparation of the soil is indispensable where the best results are desired, any piece of ground, whether rich or poor, may be seeded down and made beautiful. Mr. T. B. Terry, the well known writer and lecturer, has the road in front of his place carefully graded and seeded from fence to fence, except the wagon track. This grass is kept clipped with the lawn mower, giving the road the appearance of a drive through a well kept park.

Prof. Lazenby says that the lawn is to any place what the carpet is to a furnished room—indispensable. Prof. Bailey calls it the ground work upon which you can put trees, shrubbery and flower beds and make such a picture as you see fit.

Whatever the situation or surroundings may be, certainly no place in the country can be at its best without grass. This is a direction in which nearly every place may be improved with but little labor or expense.

ORCHARDS OF FARMINGTON.

A. W. LATHAM, SECY.

On the 23d of July, I had the pleasure of visiting at the homes of some of our members at Farmington, situated twenty-five miles south of St. Paul. I had at a number of times been through that section on the railroad and noticed that it was quite level there and wondered that there should be any good orchards in that vicinity. The society has several very earnest members there, among whom the names of Ditus Day, so many years our treasurer, L. E. Day, his brother, W. L. Parker and D. F. Akin, are all familiar. Mr. Parker met us at the depot, and a ride of three miles south of the village over a gently rolling country brought us by a short turn in the road to his cosy home. Turning to drive into his yard, a glance at the east revealed the secret of the success of his location for an orchard. Mr. Parker's place stands at the very summit of a long, gentle incline, which at a distance of several miles must fall away the better part of a hundred feet, and beyond that the horizon is skirted with hills which merge further on into the bluffs along the Mississippi river. On the south, at a distance of fifty or sixty rods, is an excellent windbreak of second-growth timber, and also on the north and west at a little less distance. It is open to the east, allowing necessary air drainage, and has protection in just the right measure and way on the other three sides.

Mr. Parker has a large number of varieties of apples, many of which, however, have been planted within the last three or four years. But his older trees of Duchess and Tetofsky and some of the hybrids, perhaps twenty years old, are very healthy and reasonably vigorous, and carry at present a very large crop of fruit. It is probable that the character of the soil and the presence of water within reach of the roots has much to do with Mr. Parker's success in apple growing. To a depth of twenty to twenty-two inches the soil is a rich loam, containing very little, if any, sand, yet light and friable and not very sticky even when wet. Below that depth is found light yellow clay containing plenty of lime. With similar conditions and with such an object lesson before them, it is a wonder that others in that vicinity do not follow Mr. Parker's example and plant large orchards. In looking over his garden, besides a variety of beautiful flowers in which both he and his wife delight, I saw many kinds of small fruits. I noted the Older raspberry, which is a black-cap fairly well known, that does well with him without winter protection, bearing, he says, every year a fine crop of berries without failure, while other varieties have winter-killed except where covered.

At the home of Mr. Henry Trout, a mile east of Mr. Parker's place, we found a very nice orchard and garden of perhaps a hundred trees, showing signs of perfect health and bearing heavily. Quite a number of his trees have been set twenty or more years.

At the home of Mr. Ditus Day, half a mile south of Mr. Trout's place, we found scattered along the north and west sides of an enclosure of deciduous trees an orchard containing some sixty or seventy varieties. Many of these trees were some years older than Mr.

Parker's, and most of them were well loaded with fruit. The situation is not quite so favorable as the others noted, being on somewhat lower ground, but still as compared with land east of it it would not be considered low. The soil there, I judge, is exceedingly favorable to fruit trees, as these trees were doing well, even standing well up to the south and east sides of a windbreak, which would not be considered a very favorable situation. Mr. Day thinks very much of the Malinda apple, which keeps well with him until spring, and the trees appear to be about as hardy as the Duchess and carry a good crop of fruit. Some of his Malinda are amongst the oldest of his trees. He intends to top-work some of the crab seedlings on his place with that variety. The opinion that more non-blighting crabs should be planted in our commercial orchards was emphasized here by a statement which Mr. Day made in regard to two trees of the Montreal Wax, nearly a quarter of a century old, and probably twenty feet high and wide. They have borne him an average of ten bushels apiece every other year, which sold for a dollar a bushel.

I found very little blight in any of these orchards. With some exceptions in the case of young trees, they were standing in the grass, though at Mr. Parker's orchard they were fairly well mulched. The difficulty of cultivating the ground with these low branching trees when they reach much size is apt to bring about this state of things. At Mr. Day's we found a part of the orchard occupied by the hogs, and there under the trees the ground was well loosened up and free from grass. He commended this practice, which seemed wise. None of these places would be called exceptionably good for orchard growing, but fairly so, and with suitable attention to windbreaks, a rolling country with clay subsoil and water reasonably near the surface, it would seem that there might be an unlimited number of such orchards scattered throughout the southern half of our state.

COOKING AND PANTRY STORES.

MRS. H. R. REEVE, LAKE CITY.

It is said that a woman with a moderately even temper and a talent for cooking can contribute more toward the health and happiness of her family than by the possession of any other one talent.

It seems perfectly proper to speak of cooking as a talent, for in my estimation one must possess talent to succeed in that line as well as in any other. One of the greatest essentials is to be a good bread maker. Opinions may differ as to what constitutes good bread, but all will allow that to be good it must be light and sweet, that is, free from any acid tastes, flakey and as white as the grade of flour will allow. To obtain this end three things are indispensable, good yeast, good flour and watchful care. Flour should never be used without sifting and should be kept in a cool, pure atmosphere, as it absorbs flavor and dampness. Bakers say that freshly ground flour will not make good bread. Spring wheat flour is best for bread, cake and biscuit and winter wheat flour for pie crust.

Too much can not be said in favor of the coarse flours, such as graham and corn meal, and of the cereals for breakfast food.

An idea which is constantly receiving favor is that of using fruit more and pastry less; it is so much more healthy and also a great saving of time and labor for the housekeeper. Let those who have not tried it begin at once, and they will not regret the change. In canning fruit much of the natural flavor, color and form can be retained by adding the sugar before the fruit. A very good rule is one quart of sugar to one pint of water; let boil a few minutes, skim and add the fruit.

Peaches are much finer flavored left whole.

In canning tomatoes, let them cook *well*, not trying to keep them whole, and turn into hot glass jars and seal.

All canned goods keep better in a dark place, but jellies keep better in a light cool place and are not so apt to mold, even if kept in the cellar, if the cover is not put on for a few days after it is made.

Every housekeeper will find it convenient to have a little dried parsley and celery to use through the winter in soups, escaloped dishes, also gravies of all kinds.

If one cares to take the trouble, it is very handy to have a little box of parsley growing in the window all winter, and it can be cut off and used as necessary.

Tomatoes seem to be much more acid the past few years. Perhaps some have had trouble with their cream of tomato soup curdling. If they will try using less tomato and more milk, think they will find it more satisfactory.

It is very often convenient to have a few cans of vegetables, salmon and meats of different kinds, to be used in cases of emergency. Plum pudding will keep a long time and is very handy to have when one hasn't time to prepare other dessert.

Salads are being used more and more, especially the vegetable salads. Almost any kind of green vegetable sliced and mixed with celery and served on crisp lettuce leaves, or, if preferred, the leaves shredded and mixed with other ingredients and a dressing (a receipt for which will be given below), makes a pretty as well as palatable addition to the dinner or supper table and is easily prepared if one only gets into the way of doing it.

Tomatoes may be peeled and the top scooped out and filled with chopped celery, and a spoonful of salad dressing poured over the top. Much is added to the looks if each tomato is placed on a lettuce leaf.

BOILED SALAD DRESSING.

One cup of cream or milk in double boiler; while that is heating, beat the yolks of three eggs and add two tablespoons sugar, one teaspoon dry mustard, two teaspoons salt, one-fourth teaspoon cayenne, two tablespoons butter if milk is used. Mix and add to milk when it boils, stir till it is quite thick, add one-half cup hot vinegar just before taking from the fire; strain. This should be quite thick. It keeps some time in a cool place and is greatly improved by adding a cup of whipped cream when served.

PLUM PUDDING.

One pound raisins, one pound currants, one pound sugar, one-half pound flour, one-half pound bread crumbs, one-half pound chopped suet, one-fourth pound citron, five eggs well beaten, one-half cup milk. Spice to taste and add one teaspoon soda.

THE PEARL GOOSEBERRY.

The Pearl is a gooseberry grown from seed of the Houghton, crossed with the Ashton Seedling, by Prof. William Saunders, and worthy of special notice because, first, of its good quality; second, its size; third, its productiveness; fourth, its freedom from mildew.

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The Pearl Gooseberry.

Now, with reference to these points, I will state the result of my observations. The quality was good, very much like the Downing in this respect, as well as in color marking: but in size it averaged nearly double that berry, and that in spite of the prodigious crop

under which the bushes were laden. There was a row of some sixty-five bushes one year planted, and most of them were literally bent to the ground with heaps of fruit. The average was eight berries per inch of wood, and on one bush we estimated there must have been 2,500 berries. We have had great loads upon the Smith, the Downing and others, on our own grounds, but we have not seen the quantity of fruit upon the bushes of any variety to equal that upon these bushes of the Pearl. Should this productiveness prove constant, the berry will be of great value for the market. With regard to the mildew, all we can say is what we saw, viz.: it was entirely free from it. One bush stood next a Whitesmith, and, while the berries of that kind were covered with mildew and utterly worthless, no trace of the fungus could be found upon the Pearl.

Silas Wilson, of Atlantic, Iowa, a well known authority on horticulture in his state, says:

"The Pearl gooseberry is a great sight. There could be no more berries on the stem without crowding off the leaves. It is wonderfully productive, and I am pleased to find the quality so good. The best gooseberry I ever saw; nearly sweet. There is no question about its future."

T. T. Lyon, of the Michigan Agricultural Experiment Station, South Haven, Michigan, in a letter to the originator, says:

"I have been testing the Pearl gooseberry here for several years; in my forthcoming report (now ready for the press) I grade it for vigor and productiveness ten and for quality nine, upon the scale of one to ten."—*Canadian Horticulturist*.

A SUCCESSFUL IRRIGATION PLANT.

THOMAS H. FORD.

I have constructed an irrigation plant that is pronounced first-class. A creek runs through my land. From this I dug a trench into the bank thirty feet long on a level with the bottom of the creek, and at the end of the trench placed my pump. The water is lifted seven or eight feet. The pump is operated by means of a nine-horse-power gasoline engine, and has a capacity of 150,000 gallons per hour. The cost of running the engine is 10 cents per day, to which is added \$1 or \$1.25 for the man who looks after the engine and distribution of the water. Eight to ten acres can be watered at a cost of \$2 to \$2.25. Last year I applied the water three times, at a total cost of 80 cents per acre. My soil is a dark sandy loam, sloping to the southeast, and is nearly all in alfalfa. I watered 100 acres with one pump. The pump cost \$125 and the engine \$600, a total of \$725. This has been used two years without a cent of expense except for oil and gasoline, and I think the plant is as good as the day I started it. I have another irrigating plant of the same kind, except that the water is lifted fourteen feet, and the power is furnished by a fourteen-horse-power traction engine. The cost, however, is almost double, as coal costs \$5 a ton, the engineer must have \$3 a day, and only 90,000 to 100,000 gallons can be raised per hour. This plant will only irrigate five to six acres daily.—*O. J. Farmer*.

SEEDLING FRUITS, 1895.

J. S. HARRIS, LA CRESCENT.

I had hoped that this year (1895) would have been favorable for apples, so that I might have been warranted in making a survey throughout the state in search of new seedlings and to take farther observation such as have been heretofore noted; but learning that the fruit crop only escaped great injury from the May frosts and other causes in localities of limited extent and that many of the most promising seedlings were either not bearing or bearing very little fruit, the project was given up for a later date, and only a few trees have been personally inspected, located in Houston and Winona counties, confining our work chiefly to specimens that might be sent by mail or express or found at the state and other fairs.

At John Carson's, Dakota, Winona county, I found a few seedling trees. One of them I designate as Carson's No. 1. The tree is about sixteen years old and looks to be entirely hardy. It is a free bearer of large fruit of good appearance; quality similar to the Oldenburg, but the season about a month later. Another, Carson's No. 2, is a better keeper and better fruit, but the tree stands in sod, leans strongly to the north-north-east and has been considerably injured by sun-scald. In Houston county, Jacob Klein's seedlings, Catharine and others, were not fruiting, but all survived last winter without injury and are looking well.

The T. Johnson's seedlings, in the town of Sheldon, were all bearing to their utmost capacity. I have strong hopes that three of them will yet prove valuable additions to our pomology. The T. Johnson's No. 6 originated from seed brought from Norway. The tree is now thirty-one years old, and I am informed that the owner gathered and sold from it this season twenty-eight bushels of fruit besides some that was used by his family. The tree of No. 4 is about eighteen years old, and I should estimate the season's crop at sixteen bushels; quality good—Prof. Van Deman writes, better than any Russian he has seen; season, November or later. No. 3, sweet apple much like Talmon, as good a keeper, and the tree appears to be better.

I found some other seedlings or unknown varieties in the same neighborhood that appear to be worthy of looking after. These trees are in a Norwegian settlement, where the original orchards were chiefly planted with seedlings. At the La Crosse Inter-State Fair and at the Houston County Fair, nothing new was shown that I have not previously reported to you. At our Minnesota State Fair, there were a number of fine exhibits of seedlings, comprising fully one hundred varieties of Minnesota origin, and as a considerable number of them came from seed of the most hardy varieties produced at home, there can hardly be a doubt that some of them will become standards in our pomology. One of the largest and best collections in competition was shown by George Miller, of Rice county; they were produced on the same farm where the Peerless was originated, and some of them were said to be seedlings of the Peerless. We did not succeed in taking full notes of them. The

Miller's Greening, Prolific and Pippin were among the best of them. O. M. Lord, of Winona county, showed a choice lot of seedlings, and the Holt's Peach received the highest award as the best autumn apple. Other exhibitors of seedlings were the Jewell Nursery Company, of Lake City; Harris, of La Crescent; Day and Parker, of Farmington; Howard, of Hammond; Pearce, of Chowan, and some others. The highest award for winter seedling was given to a variety shown by Mr. Pearce. We failed to secure a specimen of it to make a description from. Some very fine seedlings of Siberian hybrids were shown. Among them Lyman's Prolific is worthy of looking after, on account of hardiness, size and productiveness.

One of the most interesting and instructive collections shown at the fair was by Otto Wasserzicher, Bay Lake, Crow Wing county, placed with the Aitkin county exhibit. It shows, first, the possibilities of our seedlings with Siberian crosses, and, second, the probability of developing an apple producing region much farther north than heretofore anticipated. Unfortunately, they were not placed in the competitive exhibits and were not generally observed as they ought to have been. Four of the seedlings were of a size and appearance to make them valuable for market and of a quality superior to many varieties that now find a place in our markets, viz: Red Cloud, Bay Lake Sweet, Blush seedling and Prolific seedling. (For description see report on "Nomenclature and Catalogue.") Some seedlings originated by the venerable pioneer of seedlings, Peter M. Gideon, and grown at the same place, should have more notice than heretofore given them.

At the Wisconsin State Fair there was a remarkable fine collection of Oldenberg seedlings, seven varieties, produced by Joseph Zettel, of Sturgeon Bay, Wis. So fine and valuable a collection from that one variety has never before been produced by one man. The prospect for raising an abundance of the finest apples here in the cold North is growing brighter, and seedlings of the Russians and crosses with our best and hardiest American varieties are destined in the very near future to furnish us the best list of apples known to the world.

A HYBRID SAND CHERRY.

In the September last number of this magazine, page 341, allusion is made to fruit of a hybrid sand cherry received from H. Knudson, Springfield, Minn. I have since had it under investigation and have examined the root, wood, leaves and buds and am fully convinced that it is a true hybrid between the native sand cherry of the North and the family of plums generally known as the Chickasaw. The history of its origin is as follows: In the spring of 1891, Mr. Knudson artificially pollenized the blossom of a sand cherry bush which I had procured from near Bismarck, N. D., and sent to him, using pollen from both the Danish morello cherry and the Miner plum, with the hope of getting a cross with one or the other of these fruits. The fruit, leaf and wood of this offspring go to show that it was the pollen of the Miner plum that was potent, and the roots, buds and season of ripening of the fruit show very plainly that the mother parent was unmistakably the sand cherry. The seed was planted

on Aug. 7, 1891, came up in the spring of 1892, and that season grew to the height of eight or nine inches. The tree bore fruit in the third year, 1894, blooming and ripening fruit just three years after the cross was made and the seed planted. It has borne a full crop again in 1895. Judging from the samples tested, the quality of the fruit is very good and of fine appearance. Ripening as it does between the cherry season and that of our best native plums, it will be pretty sure to find favor both for home use and market, and being to the manor born, it is likely to be adapted to our climate. But a greater importance that I attach to it is that it is a new departure that shows great possibilities for the improvement of the sand cherry and will stimulate experiments in crossing it with the largest and best native plums, and eventually give us even better hybrids than this and as large as the Japanese plum.

THE LOUDON RASPBERRY.—A brief account of our visit to the original plantations of this now extensively advertised new fruit at Mr. Loudon's place, Janesville, Wis., was given on page 286 of the magazine for August under the head of "Notes from the Seedling Fruit Committee." We continue of the opinion that it will prove to be the best red raspberry ever up to this time originated, and it should as soon as possible be tested in every part of our state.

The Columbian raspberry is also greatly praised by all who have had an opportunity to try it, but we have not seen enough of it to speak advisably at this time.

DISCUSSION.

Mr. Harris: I saw the Loudon raspberry before it was ripe, and the bushes were loaded; they were loaded beyond anything I ever saw. I like the growth of the bushes, and from the appearance of the plant it must be hardy, and it is perfectly free from any disease whatever. It is more productive than any other red raspberry that has ever been brought before the public.

Pres. Underwood: Are there any questions to ask on this paper?

Mr. Brackett: Has Prof. Green tried them at the experiment station?

Prof. Green: We never fruited it. It seems to me it is a little early to endorse it quite so heavily as Mr. Harris does. I should like to see it disseminated through a wider range.

Mr. Harris: I saw it at Sparta and at Janesville and compared it with the Cuthbert, and it was so far ahead of them that a man would get excited. It excels everything in the way of raspberries I ever saw. In quality it surpasses everything. Mr. C. W. Sampson brought a peck of them home and I brought a peck home, and we carried them around in our travels and showed them off a good deal, and they kept four

or five days without spoiling, without losing their flavor or color; and I understand they have been shipped one thousand miles and back to test their shipping qualities, and they came back all right. While the berry is juicy, there is something about it that holds it up good. I suppose Mr. Philips could tell you more about it than I can.

Mr. A. J. Philips: As secretary of the society in our state, after Mr. Green began to advertise the Loudon raspberry, I received a great many letters asking questions in regard to it. I did not know any way in which I could truthfully answer them except by making a personal investigation. I spent two days there, and we gave it a very thorough examination on Mr. Loudon's grounds, so as to answer questions understandingly, and I came to this conclusion—I as well as Prof. Goff—that if it proved as good in every respect and in every locality as it did on Mr. Loudon's grounds it was a very valuable acquisition to our list of good red raspberries. I picked on Thursday afternoon a half bushel, and I carried them from Janesville to Ft. Atkinson, and we had them on the table for dinner, and the next day I went to Madison and from there to Sparta; I wanted them thoroughly tested; I wanted some good people's opinion as to the quality. I reached home on Sunday evening, and on Monday my wife put up the balance and scolded me for giving away so many, because she wanted to can them. Those berries kept from Thursday until Monday.

Last season Mr. Loudon was anxious we should investigate again, and as I was satisfied the question would come here, I advised Mr. Loudon to have Mr. Harris come down. I knew the people would have more confidence in Mr. Harris than in me, so Mr. Sampson and he came down. Mr. Sampson thought it was a long way to go, but we said we would pay part of the expense. He went down and looked down the row a little ways and said no one had anything to pay, he was paid already. Mr. Loudon does not wish to put the berry out unless it is worth something. I think Prof. Green's objection is well taken. I think we accept too many new things without first thoroughly testing them. I set last spring fifty of the Loudon, and I fruited some the first season. I picked some of the fruit and carried it to La Crosse to the fair. The berries have been grown for four or five years at Mr. Loudon's, and the plants are healthy. As secretary of our society, I recommended to our people to plant a few of the Loudon and a few of the Columbian.

the berry that Mr. Coe represents. I said if they did not plant them and they proved to be good they would be wishing they had planted some, and if they did plant them and they are worthless they would be glad they had no more of them. At present I think it would pay to plant a few of these berries. I would not recommend any one to plant a large amount. Mr. Coe is a better judge of small fruits than I am, and he was there and examined them.

Mr. Brackett; What can they be bought for?

Mr. Philips: About forty or fifty cents apiece; cheaper to the trade, of course.

Mr. Brackett: Can they be bought any cheaper than last year?

Mr. Philips: Well, no, I think not. A number of men say they will wait before buying until they get cheaper. My boys said to me last fall, "don't you sell them or give them away." I have not given them away, and I have no plants to sell. All those men that got hold of them are going to grow them.

Mr. Harris: They do not increase nearly as fast as the Cuthbert, and I know it is an outrageous price to ask. I said it ought to be tried here, because if it is as good a thing as it looked at Mr. Loudon's, the sooner we get it as a market fruit and a home fruit the better.

Mr. Wedge: I would like to hear from Mr. Coe in regard to the Columbian.

Mr. Coe: I want to say just a word about the Loudon first. I was at Janesville at the time that committee met there, and as Mr Harris and Mr. Philips told you, it was a sight. The whole plantation of Mr. Loudon had been dug and dug for plants, and had had no cultivation whatever, but I found the Loudon was fruiting abundantly, good large berries, almost as large as two of any other kind. I considered that a better test than if the plantation had been in a high state of cultivation. A word about the Columbian. Two years ago I was in New York on the Columbian grounds in the height of the bearing season. My people live there. I took the pains to go there and investigate, expecting, of course, to see a large berry, a strong grower and a wonderful yielder, but any idea I had previously entertained was entirely thrown in the shade. The original plant stood in the man's garden—this was in July, and no one was allowed to pick any fruit—and when he picked the berries that year he picked twenty-eight quarts from one hill. By his house he had the first patch he propagated from his original

bush, which was then about one-third of an acre; they were three years old and stood, without summer pruning, ten feet high. The canes were an inch in diameter. It is different from the Loudon in this point: It is supposed to be propagated from tips instead of sprouts. It certainly is a wonderful berry in my estimation; at any rate I was so well pleased with it I secured plants enough to grow an acre.

Mr. Brackett: You have an acre of plants?

Mr. Coe: Yes sir.

Mr. Wedge: What is the color of the Columbian?

Mr. Coe: Like the Shaffer's Colossal.

Pres. Underwood: How does it compare with Shaffer's Colossal?

Mr. Coe: Most people, I think, would pronounce it better than the Shaffer, not too tart.

Mr. Wedge: Is it a good shipper?

Mr. Coe: It never crumbles or falls to pieces when you pick it.

Mr. Sampson: Does it require winter protection?

Mr. Coe: It has not been tested in the West. I have never covered mine.

Mr. Brackett: What is the price, if that is a fair question?

Mr. Coe: I do not know that it is a fair question. Well, the price is 50 cents apiece, or \$25 per hundred.

Mr. Harris: I do not know anything about this new raspberry. I saw the fruit on Mr. Coe's place. The fruit is good; his description is correct. A little lighter and brighter color than the Shaffer. Wherever I saw the plants they were vigorous and healthy, but after they get one year more of age I can tell better than I can tell now. I have two plants left, and I will know what the winter will do.

Prof. Green: I fruited the Columbian last year and this year again. I never fruited the Loudon. The Columbian is very much after the style of the Shaffer's Colossal, very much resembles it in cane, berry and leaf. It roots easier than the Shaffer's Colossal and is much easier to propagate. I think the fruit is considerably better. It grew so fast it puzzled me how to cover it.

A Voice: Could you distinguish the fruit from the Shaffer's Colossal by tasting?

Prof. Green: Yes, I think I could.

Mr. Philips (Wisconsin): I will say that Mr. Harris was much interested in those seedling apples exhibited from Door

county. There was one there that he pronounced the best apple at the Wisconsin state fair, and the appearance of the apple was such that I made up my mind before winter set in I would visit those trees, and I did two weeks ago. I told Mr. Zettel—he has a large orchard, the largest collection of seedlings I ever saw together—I told him he could grow things we could not grow in our part of the country and in Minnesota. The scions I got there I wanted to be tested in our country and in Minnesota. I think he is a very conscientious man. He said, “I don’t want you to take those; I have not fruited them long enough so I can recommend them.” I told him, “The Duchess has fruited with me without injury for twenty-five years. I will take the Duchess for comparison. I do not want a scion unless you know it to be as hardy as the Duchess.” What we will get out of them for the Northwest I do not know. I have got one variety that Mr. Zettel calls his own, and I notice he is propagating that, he is raising young trees from that variety. I have some of those apples in my satchel. I think the quality is very good. I think we are going to get something there that is valuable; still I would act on the same basis that Professor Green does. We have to try them very thoroughly.

Mr. Harris said last summer he was looking for the coming apple, and he believed the time was coming when he would get it, and I believe I am on the track of it. There is a man in Wisconsin who has an orchard of Duchess that have been fruiting for twenty-five years. He told me a man in Maine had a seedling that was better than anything we had here. I will give you the description he gave me. It is almost Harris’ ideal apple. After he gave me this description, I offered to exchange for anything we had in the West. He said he would not exchange again. He says it is an apple the tree of which is hardier than the Duchess, the quality is better than the Wealthy, it will keep two months longer than the Wealthy, and if that does not come pretty close to Harris’ idea, I don’t know what will. He said he would send me a dozen scions for a dollar, and he sent me one of the apples. I wrote him to send me apples to bring to this meeting, and my wife says it is “a fool and his money soon parted.”

Mr. Harris: Now, many of you think I am a little crazy on seedling apples, as Mr. Lord is plum crazy, but the sooner we get anything on record the better; that is the reason I mentioned those new seedlings that are good for something.

In another report I shall give you a description of six of those varieties, and the trees are hardier than the Duchess; we have Mr. Zettel's word for that.

Pres. Underwood: I would like to emphasize this thought to members of our society, that there is not a year but that there is some new seedling apple comes to our notice, and just as an illustration I will mention that one of our men found a seedling growing perhaps twelve to fifteen miles from our place, in Wisconsin, back on the prairie in an exposed location, and it was obtained in this way: A Norwegian family bought a half bushel of apples about fifteen years ago. The wife saved some seeds and planted them and from that planting has raised a number of seedling trees, and there are some of the apples I think are very promising. The old lady would not allow anything to be cut from the tree. They ought to cut off some of the limbs, and I think the trees would do better. She had allowed them to go without any trimming. One day some tree agents came along and persuaded her that the tree should be trimmed, but it did not prove to do well. They trimmed two or three limbs off and injured the tree, and after that they would not allow anything to be cut off the tree. There were two trees that had fruit last summer, and they were nice apples, and one of them gave indications of being quite a keeper. She said they sold seven or eight dollars worth of apples and had all they wanted themselves. I just think this: if every one would go to work and save apple seeds from our hardiest kinds of apples and plant them, we would develop a most wonderful crop of seedlings in a few years. Save your apple seeds this winter and plant them in the spring and get them started; then you can take the wood and top-work it, and you can find out what the fruit is. If we could get enough people at it, in five or six years we would have all the apples we wanted. We would have wonderfully interesting results. At our table every day or evening a few seeds are saved when we eat a good apple, and we have a lot of seedlings saved in that way.

Mr. Philips: When Uncle Zettel took me to see the trees, we were eating apples, and I noticed the old man, when we came under that particular tree from which we were eating the apples, he would take out the seeds and stick them into the ground. I said, "You do not expect to live the winter through, what do you want to plant those seeds for?" "O, to do somebody some good." If we would all do that same thing, we should have some apples.

August Calendar.

J. S. HARRIS, LA CRESCENT.

The man who would succeed in any kind of business does not depend upon chance or luck but looks after the business in all of its details. The orchard and fruit garden should be looked after, if not daily, at least once or twice a week. See that fences are kept in perfect repair. A loose staple may admit a drove of stock that in a single hour will trample, break down and destroy the labor and care of months.

Early varieties of apples should be gathered clean as soon as ripe, and the surplus disposed of, and inferior specimens should not be left upon the ground to rot and breed insects, but be picked up and fed to stock or otherwise disposed of. By doing this promptly, the apple worm crop of the late varieties and of next year may be greatly diminished. Bands of carpet, bagging, or other fabric fastened around the trunks of the trees with a single long tack will catch many apple worms. Examine them weekly and kill all that are found. Trees will frequently be broken by accident or careless pickers. Saw off injured limbs close to another branch or the trunk of the tree and cover with grafting wax, shellac or paint.

In some sections the oak pruner (*Stenocorns putator*, of Peck), or some nearly allied insect, is doing considerable damage to the orchards. Its presence is detected by small branches lying under the trees as neatly severed as if cut with a saw. In splitting open the cut end of such branches, they will be found to be perforated several inches in the course of the pith, and a slender grub, the author of the mischief, will be discovered therein. (Later we will give a description and life history of the insect or engage Prof. Luggler to do so.) This grub remains in the branch over winter and is transformed into pupa and comes out next season a perfect insect and deposits eggs on other branches to perpetuate its species. All fallen branches should be gathered up and burned to prevent the development of the beetles. If trees set last spring are suffering from drouth, either keep the surface loose by frequent hoeing or mulch them or both. If the growth is feeble or the leaves wilt on hot, dry days, the trunks should be shaded or wrapped with burlap or paper to prevent sun-scald.

Young trees may have their shape controlled by pinching in shoots that grow too rampant, thus diverting the sap to weaker branches. Water shoots, or sap sprouts, should be removed while yet soft, and this month is the best of all for doing it.

It is a good time to make clearings of wood lands for a future orchards, either by grubbing or cutting the trees close to the ground, on account of the lessened liability to sprout again.

BERRIES.—Keep the new beds free from weeds. The hotter and dryer the weather, the faster the purslane will grow. Keep it hoed out of the rows, and rake into piles between the rows or carry it off and feed to the pigs. When the rows are sufficiently filled with plants, it is well to keep the runners clipped to prevent the formation of a surplus of weak and inferior plants.

When the raspberries and blackberries are done bearing, cut away canes that have borne fruit and then cut the suckers of red raspberries and blackberries to a sufficient number for next year's fruiting and give them a chance to get well matured by the end of the season. They should be kept clean from grass and weeds, so that hoeing and cultivating may not be necessary after the middle of this month. No more pinching back of canes of grapes or berry plants should be done after the first of this month. With the berries there is danger of next year's fruiting buds being forced into growth and the wood failing to ripen up ready for winter, and with grapes it retards ripening somewhat, besides weakening the vines and inviting mildew and rot.

FRUIT BLOSSOMS.

R. S. MACKINTOSH, ST. ANTHONY PARK.

The following is a short report on the blooming of some of the fruits noted this spring (1896). The dates are from the experiment station and consequently may differ from other localities.

The Cheney plum first opened May 2, followed by the standard varieties the 4th inst. The Strawberry crab and Duchess apple opened the 4th, followed by the Wealthy and others the 6th inst. The weather up to the 11th was very favorable for the insects to carry pollen. On the 11th and 12th, there were showers with considerable wind, which washed off nearly all the petals.

In some sections south of here, the plums were in bloom before the above and suffered considerably by being open when the weather was wet and windy.

The currants blossomed full, but for some reason did not set much fruit. From several places I have been told the conditions were as above.

At the university farm the first bloom was seen on the strawberries May 27th, somewhat later than in many other places. The weather, most of the time was favorable for pollination, but those that blossomed earlier did not have as favorable weather.

Raspberries and blackberries opened the last of May and were full of bloom. The fruit has set very well.

INTERNATIONAL HORTICULTURAL EXPOSITION.—It is proposed to hold an international horticultural exhibition in Hamburg, Germany, in 1897. Everything pertaining to horticultural and botanical culture is to be presented at this exhibition, which will remain open all summer.

Secretary's Corner.

A WELL EARNED VACATION.—Prof. S. B. Green has gone to New England to enjoy his summer vacation.

DESTROYING THE LEAF HOPPER.—W. C. Strong, in his "Fruit Culture," says that "Carrying lighted torches through the vineyard will attract and burn the mature winged hopper." At an earlier stage "syringing with tobacco water, hellebore, etc., is serviceable."

COLD STORAGE FOR THE STATE FAIR.—This will remind you again of the free cold storage provided in Minneapolis for fruit intended for exhibition at the state fair. Tags, etc., for this purpose can be had of Secretary Latham, and any information wanted on the subject can be secured from the same source.

HAVE YOU MADE YOUR STATE FAIR ENTRIES?—It is a great advantage, both to you and the management, to decide early what you will exhibit and make the necessary entries. Show the *best* you have. As a rule, others do not grow better fruit than you. If you have no premium list, send to Secy. E. W. Randall, Hamline, Minn., for one and give it careful study.

SUB-DIVIDING THE FRUIT EXHIBIT.—The plan adopted at the last state fair of placing the different classes of fruit exhibits by themselves worked so satisfactorily that it will be continued this year with, perhaps, some slight modifications; the professional exhibitors will occupy different tables from the amateurs, and all the single plate entries will be put by themselves; also seedling apples, plums, grapes, etc., in separate locations.

SEEDLING FRUITS.—Samples of all new seedling fruits of value should be sent to the seedling fruit committee of this society, Mr. J. S. Harris, La Crescent, Minn., for examination, to be reported on later through the magazine. Fruit so sent should be allowed to approach maturity on the tree and can be sent safely by mail by wrapping in cotton and putting in a strong pasteboard box. It should be accompanied by a description and history of the parent tree.

THE LAW VS. NURSERY PRODUCTS.—The American Association of Nurserymen at its late meeting in Chicago, June 10-11, devoted considerable attention to this subject and finally adopted the following:

"Resolved, That all laws enacted by states, discriminating against nursery products shipped into such state or states, are hereby condemned by this association as unfair and unjust to interstate commerce and in every way objectionable, and we ask the repeal of all such laws."

GIRDLING FOR EARLY PRODUCTIVENESS.—Mr. E. H. S. Dartt is continuing this year his experiments in this direction in his orchard with such satisfactory results that, as he writes, he expects to have many specimens at the state fair produced by this process. All our fruit growers are interested in these experiments, and we look for a report from Mr. Dartt covering his larger experience therein with a hope that it may suggest something of general practical benefit.

OUR APPLE CROP.—Judging from what is known of a few orchards the yield this season is to be a large one, though the fruit is not, perhaps, up to maximum in size. Mr. Wm. Somerville was in the city on July 22 to dispose of 200 barrels, and the day after Mr. E. H. S. Dartt on a similar errand, though the estimated yield in his case is higher, probably 2,000 bushels. Mr. Ditus Day thinks he has 300 bushels and Mr. W. L. Parker has nearly the same. Others speak in a general way of a successful fruitage.

SET UP YOUR OWN EXHIBIT AT THE FAIR.—While any fruit sent to the state fair, where the proper entries have been made, will be set up by the management as well as possible under the circumstances, still no one can do this so well as the exhibitor, and except in the case of small exhibits it is not the part of discretion to depend upon it. There is a rush of work at that time and often lack of full understanding of the purposes of the exhibitor, which does not contribute to best results. By all means, come and set up your exhibit yourself, if at all practicable.

"FRUIT CULTURE" BY W. C. STRONG, NEWTON, MASS.—This neat little handbook was first published in 1885 and revised in 1892. The writer is a nurseryman of long experience and evidently well fitted to furnish such a guide as this for the amateur in fruit growing, for whom it is evidently intended. It treats in a general way of the various kinds of fruit grown in the North and, while not especially adapted to this section, will be found a work worthy of careful perusal. It is a duodecimo of 225 pages, very handsomely printed in cloth by the Rural Publishing Co., New York.

LOW PRICES FOR FRUIT.—Chas. W. Garfield, the noted Michigan horticulturist, in a personal letter from Grand Rapids, says, "Fine Wilson blackberries are retailing from our stores today for five cents a quart box, and the finest Cuthbert raspberries have sold as low as three and a half cents per quart by the case." Verily the Minnesota berry grower with red raspberries at \$1.50 per case of 24 pints and a fair crop in comparison, hath cause for thankfulness. Mr. Garfield speaks also of the "tremendous crop of apples, exceptionally fine and free from blemishes."

HORTICULTURE IN THE PUBLIC SCHOOLS.—A committee from the Missouri State Horticultural Society, of which Mr. G. B. Lamm, of Sedalia, Mo., is chairman, has been working several years upon a plan for securing the information needed in preparing a school book for use in the public schools. It would seem a wise thing to furnish the youngsters at an early age such simple information on this subject as they can understand and remember, most of which can be done to the best advantage, at least in the country, by the aid of object lessons. A suitable handbook to assist in this process would be a great help. We are interested to know how our Missouri brothers prosper in their experiment and the details of it.

FRUITS FOR THE WINTER MEETING.—Don't forget to save some of the best specimens for this purpose, now that arrangements have been made to store them here in a suitable cold storage to be kept till wanted without expense to the sender.

Suitable premiums will be offered, so that no loss will be sustained by the exhibitor. We hope next winter to make a very full and interesting exhibit. Indeed enough have already signified their intention to assist to assure it; but it is hoped all the fruit growers in our society may save something of their best and bear a hand with us. Tags to be used in sending fruit here for storage can be had by application to Secretary Latham.

FRUIT EXHIBIT AT THE FAIR.—Enough is known of the probable show of fruit at the coming state fair, which opens Aug. 31st, to make it certain that it will be up to the average, but we naturally want it to be the very best ever made in our state, and, no doubt, the fruit is here to do it. The regular exhibitors, who from experience appreciate the advantages of attendance at the fair, will undoubtedly be on hand, but it is very desirable that others who have not heretofore attended should also come and reap these advantages, which come largely from the opportunity of intercourse with the experienced pomologists who are there, supplemented by the object lesson of such an exhibit. Come, if possible, and you will be greatly the gainer.

MISSOURI BOTANICAL GARDEN.—Our library has been lately enriched by the addition of a full file of the annual reports of this garden, in all seven volumes. They are valuable as works of art, but chiefly, of course, from the character of their contents. This garden was originally founded by Henry Shaw in 1857, and maintained by him till his death in 1889, when it passed by devise under the management of a board of trustees. It is amply endowed in land and means to continue its work of usefulness. The first annual report appeared in 1890. The founder is buried in the garden of his planting, and a splendid tomb stands above his remains. He has planned well to perpetuate his name, and will be spoken of with feelings of gratitude for generations after the multi-millionaires of the present day who are devoting their possessions to personal gratification are absolutely forgotten. What a monument!

THE BORDEAUX MIXTURE FOR POTATO BLIGHT.—Experiments at the Rhode Island Experiment Station in 1895 (see Bulletin 38) demonstrate the possibility of the prevention of this dreaded disease in the potato field. In a season when no other good potato field could be found in that section, at the station, by a judicious use of the mixture from July 6th, when the disease first appeared, seven applications in all, till late in August, a yield was secured of about 360 bushels to the acre, and the engraving published shows the tubers to have been large and well formed. No applications were made till the blight appeared on the vines, and from that on they were kept well covered with the mixture. Here is the formula used:

Equal parts of quick lime and sulphate of copper, with four to eight gallons of water for each pound of the sulphate of copper. Both the quick lime and the sulphate of copper are dissolved separately and passed through a fine strainer (forty meshes to the inch), and not mixed till the milk of lime is cold.

A home made sprayer suitable for this purpose is described on page 238, June Horticulturist.

James A. McArthur

(See Secretary's Corner.)

THE MINNESOTA HORTICULTURIST.

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THE LANDSCAPE GARDENER IN THE COUNTRY.

F. H. NUTTER, LANDSCAPE ARCHITECT, MINNEAPOLIS.

I once had the pleasure of attending a lecture by that eminent philosopher, "Josh Billings," the advertised subject of which was "Milk;" on being introduced he solemnly poured out a glass of milk from a pitcher on the stand and drank it. Those who remember the peculiarly connected manner in which this gentleman wrote and spoke will not be surprised to learn that that was the only reference made to the subject during the evening.

If any of you have preconceived ideas as to my line of thought in this paper, you may perhaps experience a similar shock, for both our secretary and myself found it difficult to express briefly what I purposed to treat upon, so the topic as given in the program was placed there fully as much to fill the space as to convey information. The expression may also be unfortunate from the fact that to many minds the landscape gardener let loose in the country is a most dangerous personage, from whom nature shrinks aghast; and if so be that his ideal is to decorate the landscape with flashy color beds, groups of shrubbery rich in purple barberry and golden spirea, and puerile architectural adornments, there is much reason for such a sentiment.

But it may be said with truth, on the other hand, that factors unseen by the general observer may enter into the question, and work be rendered necessary for the protection of the public or of the landscape itself, which otherwise all concerned would much prefer to avoid, and which when new and until nature has time to do its gracious work of concealing and draping with shrubs, vines and humbler plants; must be painfully obtrusive.

Be this as it may, my intention this evening is to present a continuation or supplement to the paper I read at last winter's meeting in which I referred particularly to the treatment of grounds immediately surrounding the dwelling house; in this paper I wish to make a broader application of the same principles.

Our French friends have an expression which rendered into English would be "The ornamented farm," referring to those estates which have been developed along artistic lines, while at the same time the owners have not neglected the scientific and business side of their calling. So little attention has been paid to such matters in this

country that we have no word coined to fit the case, and, if so, I fear to the practical mind it would savor strongly of sentiment and therefore be frowned upon; so that few writers who have touched upon the subject have used the French phrase, partly, I suppose, on the principle that a nose that is slightly "retroussé" is much more artistic and unobjectionable than when described in plain English. Perhaps, the very use of this foreign expression has impressed some who might otherwise have profited by what was written that it was a subject which had very little to do with the American agriculturist. But I think this is not quite so, and that many a farmer, studying his farm this winter, would find opportunities for improvements that, while comparatively inexpensive, would in the end be of financial benefit and also render an annual income of beauty and happiness that he would never again willingly forego.

Few farms do not contain areas which give scanty returns for cultivation, and from a business standpoint the owners should consider a change of methods; some hillside is being tilled until the rains have washed away most of the fertility, or some coulée is, with every storm eating farther into the arable land; these places need attention and by trees and shrubs from our native forest growth should be controlled and remedied. Some slough or bog lies waste or produces a scanty crop of wild hay, and the owner hopes for the time when he shall be able to drain and cultivate it. This may be the best thing to do, for I firmly believe in drainage, especially underdrainage; but I also believe as firmly, though I am probably in the minority, that the present craze for draining lakes and sloughs which have hitherto served as reservoirs and sources of moisture, will, if persisted in, at last produce results much akin to and only less disastrous than arise from the reckless reduction of our forest area, and which can be but partially atoned for by the slight addition which may be made to our farm acreage.

So let our friend stop and weigh the question carefully if it be not in the end more profitable to devote this extra labor and expense to the more thorough cultivation of the land now in hand, and let the swamp be made a little lake stocked with fish or a reservoir for irrigation purposes, and the slough become a tract of woodland from which the household supplies may be obtained, and if in time it should afford the boys a little sport in the way of fishing and trapping it will not lessen their love for home. If there is any place to which I look back with a twinge of homesickness it is the old "pasture" where I used to set my snares and traps, and although I caught more game in my dreams than in reality, still it seems to me, even now, that the most delightful spot I ever saw was these same old woods, now, alas, mostly devoted to "city improvements."

If there be a permanent pasture connected with the farm has it an occasional clump of trees or a protecting border of timber, giving welcome shade and shelter to the stock, and variety and beauty to the scenery? If not, then draw upon the riches of the nearest woodland or nursery, and in locating the trees let it be done in reference to their effect on the landscape, by framing and emphasizing the distant view or concealing some disagreeable object nearer at hand.

It may be that a little study of the topography will enable one to so re-arrange the farm roads as to combine better grades with more graceful lines, and so carry on the work with less labor and expense, though the different fields may not be so regular in form. We emphasize, with truth, the 'simplicity and practicability of our system of government surveying; still, I think that nothing stands so much in the way of an adequate system of good public roads as does this same question of section lines, etc.; and the same at times in regard to the appearance of the farm, for frequently we find some picturesque knoll or little lake, which owned by one person might be made an object of beauty, divided among several, whose conflicting interests soon rob it of all attractiveness. We can congratulate ourselves, however, that the progress of time and the intelligent location of all important roads will after a while remedy a good deal of this.

The great question how to keep the young people on the farm, instead of rushing to the over crowded cities, where the proportion of failure to success is so great, is one of much importance, not only to the families directly interested but to the country at large; and while the agricultural colleges are doing a grand work in bringing the farm life from drudgery up to a scientific profession, I think that in addition to the financial success which is intended to be the result of their teachings there is also an aesthetic side which needs to be considered, that the farm may not only be the location of a successful business but be also a family home, to be looked back to with pleasure and affection, and which it shall be a worthy ambition to keep always in the family; for sneer as we may at "entail" and other questions of inheritance, "the homes of old England" have always been the source of much that goes to make up her power and prestige.

From farm life let us now turn to the village. It is another of the disadvantages of our methods of subdividing land that we have no connecting link between these two, except in rare occasions where the occupants of adjacent farms may group their homes and buildings around the common points where their lines intersect. The social Frenchman has found a remedy for this evil and in Canada is content to lay out his farm with a narrow frontage and great proportional depth so that the highway has the appearance of a continuous village. Another method which, while European, is being adopted in some of the recent colonies on the Pacific coast, seems to be a happy medium in that each land owner has a home lot of an acre or two in the village, while the farms proper surround this center. The success of this plan will be watched with interest, but would probably involve too many radical changes among those who regard a quarter-section far too small a field for their endeavors to be introduced in this part of the country.

So we have the conventional village plat to consider, with its checker board arrangement, squared with the section line or the railroad, with twenty-five foot lots, and often with no apparent reason for its location but the arbitrary will of man. On a level prairie, doubtless, this checker board plan is as good as could be devised

in most cases, but often, especially in a hilly country, there may be reasons for different methods, and if the establishment of a new town or extensive additions to an old one are contemplated it will be well to study the matter in all its bearings.

Is it a place that from its location promises to be an important business point? Then let the principal streets leading out into the country be first located, radiating from the business center in such a way as to best accommodate the expected traffic, and the rest of the plat be made to fit them. The real estate speculator will perhaps be horrified at the havoc this may make with corner lots, but the careful examination of the map of any city, from Minneapolis and St. Paul to Washington and Paris, will prove these diagonal streets to be the most important of all; the two latter cities are conceded to be the most beautiful in their respective continents and, though in Paris military considerations were probably of great weight, still the plan gives most striking artistic results.

But we are getting a long ways from the country, so we will turn again to our village improvements.

How rarely is the topography of the proposed village considered at all, but the streets are located on paper and future generations left to struggle with the questions of grades, drainage, etc., when they come to be located on the ground.

It is said that some zealous temperance advocates were wont to take around with them on their travels some "awful example," which to point a moral they held up to the reprobation of their audiences. On this principle I will cite a case, which shall otherwise be nameless, lest I should hurt some one's feelings. I have in mind a thrifty village on the shores of a beautiful lake; on one side of the town, public buildings occupy an attractive site of several acres, sloping towards the water; but through the heart of the place is a ravine, formerly wooded, with a little brook rippling through it, which was ignored in the platting; therefore, each transverse street requires heavy grading and a culvert, and the valley being at present, at least, valueless, is a dumping ground, and refuse from adjacent stables and houses rolls down the banks, to be in heavy storms carried out into the lake, and spread by the waves along the beach; and if in course of time disease results, it will be almost profanely called "a mysterious dispensation of Providence." Let our imaginations now consider the scene as "it might have been," those "saddest of words." Varying from our checker board plat when this ravine is reached, let us locate a roadway on either side from the shore of the lake with its present waterside street to the head of the ravine, where, joining in one, it curves away to the railroad station. The ravine has now become a park, and if necessary to carry one street across it let it be on a light iron bridge; a foot path is led down the gorge under the old trees and beside the brook with its occasional pool and tiny cascade, and we have a spot of beauty and health instead of a disease-breeding nuisance. The surrounding houses now face it instead of turning their backs contemptuously upon it, and it has become the residence center of the village.

Many of the smaller places of the state can now, at slight expense, bring about some such revolution in localities that will in the future years require much larger expenditures in the interests of public health and morality if neglected. It is a fact too often overlooked that the tracts best adapted for parks are frequently the ones which threaten to become nuisances in their present conditions.

Street trees are prime factors in village improvements, but it cannot be necessary here to go into methods of handling them in detail; but we cannot emphasize too strongly to the general public that success in transplanting demands good trees, good soil in large quantities, care in setting and then watchful protection against droughts and dangers both from man and beast. It may involve considerable labor on your part, but future generations will bless you for it.

Do not set the trees too closely; a distance of forty feet for large trees will be about right; above all, don't trust to future thinning out, for no one will have the nerve to do it.

The essentials of a good street tree are perfect health in adverse circumstances, upright growth, not branching lower than eight or ten feet, and long life.

"The Tree Planting and Fountain Society," of Brooklyn, N. Y., recently sent circulars to most of the leading landscape gardeners and nurserymen of the East asking for short lists of species suitable for street planting, and there was a surprising variance in their replies. Many of those specified would be useless here, but one or two facts may be of interest. The hard maples are slightly ahead, followed by the elm, which, however, is pronounced useless by some in the vicinity of New York and Philadelphia on account of a foreign leaf-beetle which has reached our shores, with a name which I will leave with Prof. Luggier to pronounce and a constitution apparently as ironclad as the name, for it is fast destroying all elms, wild or cultivated, in spite of all preventatives. It is to be hoped that it will not come in this direction, but doubtless it will be well to be on the lookout for it.

Oaks, especially of the so-called black oak class, with spring leaves and requiring two years to mature their acorns, have many friends, and with proper nursing treatment when young and transplanted when ten to twelve feet high are said to be very hardy and vigorous, and our own woodlands, especially in autumn, proclaim them to be most beautiful trees.

Several varieties not often used for the purpose are also recommended, among them the laurel-leaf willow and wild cherry; the Kentucky coffee-tree is also mentioned, and in the southern part of Minnesota, where it is found native might be of value, as it is a stately tree with almost tropical foliage.

The best results here have doubtless so far been obtained with the white elm, followed by the ash, and the linden when unmolested by insects and protected when young from sun-scald, which is the great enemy of all smooth-barked trees. Of the smaller trees, the hackberry and the box elder are commonly seen, while the pioneer's tree, cottonwood, is almost invulnerable, and by setting only

staminate trees, known by their large red flower buds and reddish tassels, the cotton nuisance may be avoided.

The Brooklyn society makes a suggestion in regard to artistic street planting which is worthy of consideration; it is to plant at each block corner two trees of the largest growth at the points where the fence lines if extended across the walk intersect the tree planting lines. This would give eight trees at each street intersection, which would finally grow into groups, over-arching and emphasizing these intersections, the blocks between these groups to be planted with smaller and more ornamental trees and forming, as it were, a section of a parkway. The local arrangement of fire hydrants, catch basins, etc., at the street corners might make some modification of this plan necessary.

As to village parks, the time is at hand when more consideration will be given this subject. I have already spoken of the wise economy of dedicating some waste and broken area to park purposes, but it may be well to emphasize it a little.

I have in mind a small city in this state having within its limits a beautiful stream with much waste land along its banks, which if secured for the public would be at once or with but little labor a most beautiful park; but in the discussion of the park question attention has been turned almost exclusively to the securing a few acres of land on the outskirts of the city, in no wise to be distinguished from the thousands of acres of prairie which surround it, leaving the banks of the stream, almost in the heart of the city to be the common dumping ground of the stables, houses and stores. The flight of years could only bring deep regrets if such a course is persisted in.

Another point which is almost, if not entirely, neglected is that of providing a village play-ground, an entirely different matter from a park, although if circumstances permit they may sometimes be combined, but it should be remembered that a park is intended to be a place where in peace and quietness, under the shading trees and in the communion with nature, one may gain rest for both mind and body.

Do you know of a village where the young people in their sports do not have to trespass on private property or occupy the highways to the danger of all concerned? Or else, eschewing all entertainment of this kind, seek amusement by loitering around the street corners and stores with their evil influences or in the all-welcoming saloons. I think that right here is a field in which temperance and other organizations might do a good work.

Turning now to a larger field, I might, if time would permit, speak of the preserving for future generations, as near intact as circumstances will permit, of those places of particular interest which from their natural beauty or from historical associations are worthy of such action. Something has already been done in this state in that direction by the marking of battle-fields, the setting apart of 35 square miles of land at the source of the Mississippi, and the securing of a tract of land at the Dalles of the St. Croix River to preserve the picturesque scenery there found. This latter pro-

ject is worthy of much more attention and encouragement than the general public has yet given it. No one without personal inspection can appreciate the varied beauties of this remarkable locality, and it is to be hoped that the states of Minnesota and Wisconsin will carry the matter, now so auspiciously begun, to a complete and successful consummation. The so-called practical man may ask why should time and money be devoted to such purposes, and land that should bear crops, forests that should yield lumber and waterfalls that should turn factory wheels, forever lie idle, merely to be looked at? Similar protests of extravagance, etc., were made when the questions of public education and public health were first discussed, but now no one hardly would venture to bring them forward again.

The growing demand for these parks and reservations is based upon the recognized fact that nature not only brings to the mind and body overstrained by modern habits of life a sovereign remedy, but is an educative force as well.

"There is a dust in library nooks
Blown from the musty leaves of books
That blinds the lean scholastic's eyes
And makes him learnedly unwise.
Would you be wise, go out-of-doors,
And just intuit through the pores;
For these bright flowers and these blue skies
Were sent to make dull bookmen wise."

HORIZONTAL GRAPE TRELLIS.—A modification of the "Munson" horizontal trellis has given better satisfaction than has any other method for training the vines and is the form recommended for general use. In making it, posts are set sixteen feet apart, the first one in each row being four feet outside of each vine. The tops are sawed off square at five feet from the ground, and a cross-piece 2x4, two feet long, is laid on the top of each, and nailed at right angles to the direction of the row. Three No. 12 wires are stapled to these cross-pieces, one directly over the post, and the others one inch from the ends of the cross-pieces. The cost of material is about \$7.50 for each one hundred vines.

Our reasons for preferring the horizontal trellis are that it makes pruning much more simple and easy, that it keeps the lower part of the vine free from sprouts and branches which would interfere with cultivation, that it affords much greater protection to the growing and ripening fruit, that it holds the fruit where it can be easily reached in spraying, and that it gives partial immunity from the attacks of fungus diseases. It is a well known fact that very few fungi can germinate excepting in the presence of moisture. With the horizontal trellis, nearly all of the fruit is found hanging below the wires, where it is protected from rain and dew by the leaves, which are almost wholly above the wires, and so the spread of disease is to a large extent held in check.—*Miss. Ex. Station.*

OUR LATE AGRICULTURAL FAIR.

WM. SOMERVILLE, VIOLA.

Mr. President and Members of the Society: They have put it upon me to write a report in regard to our state fair, and the premiums that were offered and awarded at that fair for exhibits in the shape of fruit. In the fruit exhibit at our state fair I was disappointed with the amount of premiums offered to the exhibitors, and not I alone, but a great many others were just as much disappointed as I was, and I do not think our agricultural society treated us as we deserve. It was my opinion in the first place not to go to the fair at all, but at the solicitation of our honorable secretary and others I finally consented and went, but while I went it was not for the money that was in it, because there was not enough money awarded to anybody to pay the expense of the exhibit. I think the management of the agricultural society does not understand what it takes to get up an exhibit to take to the fair, otherwise they would have been a little more liberal in their premiums. It is quite a job to get up an exhibit of sixty, seventy to eighty varieties of fruit fit to be seen at a state fair, but I am in hopes that in the future they may do a little better with us. I think we ought to get enough money out of such an exhibit to at least pay the expense of getting it to the fair. We do not like to do this when we know that premiums, very liberal premiums, are offered for things that can be grown in a year or two years; and while we have been working for thirty-five years in growing what we exhibit, I think it no more than right, no more than justice, that we should get a liberal premium on what we exhibit there.

Our last state fair (1895) was in every department a grand success and an honor to the state. The efficient manner in which the officers and managers performed their laborious work, the order maintained throughout the entire fair, the prohibiting of intoxicating liquor or any gambling devices to be allowed on the grounds, all are worthy the praise of every good citizen. The exhibit of stock and machinery was one of highest grade. The main hall was decorated by experienced hands, and the show of mercantile goods was gorgeous beyond description. But horticultural hall appeared to be the center of attraction. Now, what was the object of the horticultural society in making such a display as would be an honor to any state? It was certainly not for the premiums offered, because the agricultural society had cut the premiums down for the exhibitors of fruits to less than five hundred dollars, a sum insufficient to pay for collecting the fruit and the expenses of those exhibiting. No, it was not for that; it was for the love of their work

and the honor of the state, to show that fruit could be raised, and that successfully, in Minnesota. The raising of fruit should be encouraged by the state by making a larger appropriation to the horticultural society, so that the society could offer liberal premiums for the best orchards of forty trees or more that have been fruited for twenty or twenty-five years; also for orchards of one hundred trees or more that have been set in orchards five or more years. Any person wishing to compete for such premiums should be a member of the horticultural society and notify the secretary that he is competing for such a premium, and the executive board should employ one or two competent men as judges to make examination of such orchards and report at the annual horticultural meeting on the kind of soil, the condition of the trees and the care and management they have received. This examination should be made the latter part of July when blight is most manifest.

Until this can be carried out by the state, the agricultural society should be more liberal in offering larger premiums for the best collection of apples and grapes grown in Minnesota and exhibited by the grower, for the best collection of summer and fall varieties of apples, the best collection of winter varieties, the best collection of Siberians and hybrids, the best collection of new Russians, the best collection of seedlings, the best single plates of fall and winter and a greater number of varieties in single plates. The professionals and amateurs should not be brought into competition either by collection or by plates. Neither do I think it right to be compelled to buy a season ticket in order to exhibit some article, the premium of which if won would not buy the ticket. We will now look at the amount awarded as premiums at the last fair—among thirty or more competitors exhibiting over two hundred varieties of apples, the sum of two hundred and eighty dollars, for more than forty varieties of grapes, premiums to the amount of one hundred and three dollars, while for plums thirty-three dollars and fifty cents; making the sum total of four hundred and twenty-six dollars and fifty cents. Could it be supposed that amount of money would pay the expense of collecting, express charges and passage on railroad and boarding a week on the ground? It certainly could not be for money that this fruit was exhibited, but to make the fair a success, which it did.

Fruit growing is not like stock raising; it requires time, labor and money to get trees acclimated to our soil and season. But with stock—the farmer is used to them, and there is little of inquiry about them. At the fair an exhibit of fruit takes the eye of the passer-by, and he stops to inquire if this fruit was raised in Minnesota, where, how and what variety, and a thousand and one questions, which you are obliged to answer. This makes one a teacher as well as an exhibitor, and you see but little of the fair outside your own building. There is no farm work which the farmer needs as much educating upon as fruit raising. They are generally willing to receive such knowledge, and why should not every means be used to encourage this branch of industry when there is such a vast sum of money paid every year to import fruit into our state that should be grown at home, as there are thousands of locations in the southern half of the state where apples, grapes, plums and all small fruits can be grown in abundance, sufficient to supply our own market and some to export. Now in view of all these facts, we consider the agricultural society did an injustice to the fruit growers of Minnesota by cutting the premiums down from the previous year.

ORCHARDING IN MINNESOTA.

OTTO L. BULLIS, WINNEBAGO CITY.

There are twelve old apple trees on my farm planted over thirty years ago. One Roman Stem, two Talmon Sweet and the rest Hyslop and Transcendent. Although located most unfavorably on level ground and surrounded by maples and cottonwoods thirty to sixty feet high, on all but the south side the apple trees have yielded fair crops on each alternate year since I owned the place—the Talmon Sweets a barrel to the tree, and the crabs have several times netted \$5.00 per tree.

I have kept specimens of the Roman Stem until the latter part of March; perhaps they would have kept longer if we had not eaten them.

Talmon Sweet, I believe, is not recommended for this locality, but if these two trees can survive thirty years, much of the time among weeds half their own height, why not have more of them? Perhaps, you say, these are exceptions. Well, as I want more exceptions, I have planted fifteen more Talmon Sweet on a bleak hillside sloping north and have also included in this orchard fifty Peerless, one hundred Wealthy and Hybernal, sixty Longfield, a few Duchess and crabs, with a dozen plums, about three hundred trees altogether. I intended to use only stock from Minnesota nurseries, but an agent from an Iowa firm arrived at my house when I was in excellent humor, having just finished a rattling good dinner. This agent had with him one hundred and thirteen three year old apple trees labeled Longfield, sixty Wealthy, twenty Duchess, ten Salome, &c, which I told him was just six too many, but as he must have an offer on them, the party ordering being a minor and refusing them, I mentioned five dollars, for as before stated I was in a very liberal humor—besides I admired his taste in labeling them and in arriving just after dinner. The price suited him so well, that, much to my astonishment, he accepted at once, agreeing to replace at half price, $2\frac{1}{2}$ c each. Whew! and in his hurry to be off, he gave me two Columbian half dollars in making change. Now, while these trees were certainly cheap, time alone will tell how dear they were.

I began my orchard with the intention of planting one hundred trees each spring, until the space intended for orcharding was filled. This gives me more time to care for the trees than if all were planted the same season. I plant them as soon as possible after receiving them—plant deep and mulch heavily with barnyard manure, being sure to finish mulching before extreme dry weather arrives. I usually plant beans between the rows, doing the plowing and cultivating myself, as I consider each tree the hired man drives over (and he would be sure to bungle a few) the cost of a day's labor.

Out of my first one hundred apple trees planted, ninety-seven are alive and thrifty. Last spring's planting did not do so well, owing partly to the very high winds prevailing at planting time, making it difficult to get roots covered while moist, and partly to careless packing for shipment.

If I could dig the trees myself and transplant at once, I think all would grow. For instance, I had a six year old apple tree that was

directly in the path of a building I was moving; I could not go around it, to pass over it was sure to destroy it, and there was no choice but to dig it up, which I did at midday on one of our hot summer days, with the tree in full foliage, replanting as soon as the building was out of the way and watering copiously. I was still surprised to see that the foliage did not even droop or differ from that of other trees in the vicinity.

EXPERIMENTAL HORTICULTURE WITH IRRIGATION IN SOUTH DAKOTA.

Pres. J. M. Underwood accepted last spring the position of manager in the experiments in horticulture by the aid of irrigation, on the Hunter-Salzer farm at Mellette, S. D. This farm is also an experimental station under the supervision of the Brookings Agricultural College. In pursuance of this work, the Jewell Nursery Co. sent out there at that time a carload of trees and plants, combining a great variety of forest and fruit trees, shrubs and small fruits, a little of most everything worth trying there. This farm is irrigated by an artesian well, supplying an unlimited amount of water delivered at the surface of the ground with force enough to run a mill. As Mr. Underwood is "one of us," and knows our needs fully, these experiments are fraught with unusual interest to us, and we have good reason to expect to learn some things from his experience there on the subject of irrigation as affecting horticulture of great practical value. That he is enthusiastic in this enterprise you may judge by the way he writes. SEC'Y.

"When Mr. H. F. Hunter called upon me and first told me of the flowing wells of South Dakota, being comfortably seated in my office and in a receptive frame of mind, I was a ready listener to the marvelous tales he told of the irrigated districts and the particular development of this most wonderful provision of nature at Mellette and on the Hunter-Salzer farm adjoining. With ears and mouth wide open I readily took in all that he said, and it was not a three inch stream either, but like the well on the farm, a full sized eight inch flow and all turned on; but my reservoir is big, and I just filled up. However, a departing train was all that saved me, for it bore Hunter away just before my capacity was reached. In the weeks that followed, evaporation went on, and I was beginning to think that it was a case of more talk than facts; but I have since paid a visit to Mellette and the farm, and I am now fuller than ever, and if I don't open the flood gates and let others know of what I saw, there is danger that the banks of my mental reservoir will burst. To you, who have not seen the wonders of irrigation and the power developed by the artesian wells of South Dakota, let me say, be sure to avail yourselves of the excursions that will be run to Mellette this summer by the C. M. & St. P. R. R. and study into them. To encourage you, I will promise that you will find a wide awake, generous, hospitable community, located on an ideal spot for a garden, and a big one, too. Far as the eye can reach the land is level or gently undulating. The soil is a rich loam, with just enough sand to make it pleasant to work and with a deep clay sub-

soil. Not a stone to dull the plow or punch the handle into your ribs while plowing. There is nothing even for the boys to pelt the birds or bull frogs with. I found the roads smooth and dry, although heavy rains had fallen when I visited there. Mounted in a musical chariot of the town, accompanied by the Board of Regents of Brooking's College, I enjoyed a pleasant drive of two miles out to the celebrated Hunter-Salzer farm. On the left, as we approached the farm, our attention was called to the process of planting 260 acres of potatoes—think of it, you who are scratching around among the stumps and stones of an unproductive, worn-out farm in the East! Here you would see one man and a team planting seven acres of potatoes in a day on ground as level as a floor; and the beauty of this land is all situated so it can be *irrigated*, for farther along on the right is the eight inch artesian well flowing into a reservoir covering about five acres, with high banks that have been thrown up to hold the water that is constantly flowing in. Although the valve is turned so that but a small per cent. of the water is used, the force with which it comes from the pipe makes a sound like a cataract and is sufficient in power to drive the machinery of a large manufactory and light the prairies with electricity for miles around. In the banks of the reservoir are gates opening into ditches conducting the water in every direction, and it is fast being arranged so as to irrigate over 1,200 acres of land. In a central location on the farm are the experimental grounds and seed farm. Men were busy fitting the land for seeds of all kinds, and the results of growing seeds on irrigated land are simply marvelous.

All the appointments of the farm are fine and everything in splendid condition, indicating the excellent management it is under. The only things lacking on the farm to make it an ideal garden are a good growth of trees for shade in summer and protection from the cold winds of winter, also fruit trees and small fruits, that are not only a luxury but a necessity for health and happiness. These have been denied sections of our country affected by drought, but happily this otherwise charming district is now being supplied with these blessings through the medium of these *flowing wells*. Is it not wonderful that, although there are no cooling springs bubbling from the hillsides or running streams winding their way across these prairies, you have only to bore a hole down into the earth a thousand feet, and you can secure a flow of water with power that will light a city, speed its travelers along on electric cars, turn the wheels of its factories and mills, water its streets and lawns, or that can conquer the drought and cover the fields with luxuriant vegetation and secure certain and abundant harvests; finally, these wells bid us to plant trees and fruits that they may add *them* to their crown of glory. Energetic, enthusiastic horticulturists in the Northwest have labored and experimented in the interests of horticulture for years, and all over the country, north, south, east and west they have not found any foe to horticulture so great as drought. Given the water they need, trees will grow indefinitely and luxuriantly; deprive them of this element, and all over the land they perish. Here then is the solution for South

Dakota, not by uncertain and often disappointing rains or floods; but by a simple turn of the wrist a valve is opened, and up from the bowels of the earth the water comes and flows at your feet and not in pelting storms upon your head. It follows your bidding through ditches or over the whole surface to the roots of your trees, that in return stretch out their arms and wave you their blessings. It is only a question of time when South Dakota will be covered with beautiful groves wherever they are cultivated and watered, and trees in return will stop the force of the winds, shade the ground and prevent the rapid evaporation of moisture and so ameliorate the inclemencies of a severe climate."

REPORT ON ENTOMOLOGY.

MRS. A. A. KENNEDY, HUTCHINSON.

December 3, 1895, is at hand, the long looked-for time has arrived at last. One year ago when we last met, the time appointed for the next meeting seemed a long way off; we counted the months, then the weeks, then the days; it is with joy we meet again, and yet it is with feelings of sadness we notice the vacant places some of our members used to fill. We miss their pleasant smiles and words of cheer, and as we scan the tables in the exhibit room, we notice empty spaces there, also, where their fruit and vegetables were wont to be piled in goodly array. And then as we remember that the hands that placed them there are folded away, and the eyes that glowed with enthusiasm as we listened with attentive ear to the words of cheer and encouragement that came to our beloved society from different parts of the state, are now forever closed, and that we shall never see them more, then we are led to wonder who of us, before this convention meets again in 1896, shall like them have passed beyond the bounds of time. And again we wonder after all is over and we have made our last exhibit, how many of us will meet to part no more, in a world where the inhabitants never say "I am sick," but where we may pluck and eat of the fruit that grows on the tree of life and talk of our failures and successes here. I sincerely hope we shall all be there. There will be no need of reports on entomology, no call for kerosene emulsion, no call for "Green's Amateur Fruit Growing," but we "shall be changed in the twinkling of an eye" from novices to scientific fruit growers.

Our secretary wrote to me that I was to report on entomology. I said to myself "What can I do with that?" Of course I know entomology pertains to insects, and I know that the honey bee is an insect, and that it is a very busy little creature, and that it sips the nectar from the flowers and converts it into a commodity they call honey, and that I am very fond of it, and that it plays a very prominent part in fertilizing our fruit by carrying pollen—but I think they must have failed in their duty in this respect this year (1895) for there was no fruit. I know, too, that there is a little white moth that hovers over the cabbage plants and deposits its eggs in great abundance among the leaves, and presently we find the cabbage is filled with worms; and when they have done all the mischief they can they

hide themselves for a season, but in due time they come forth and follow the injunction of their mother to "go thou and do likewise." And *they* are insects, and they put in good time this year.

Then, there is the potato bug, another insect, but it failed to put in an appearance this year. Whether they were all frozen to death or whether they have decided to move to Sunnyside or Kennewick, where the climate is more congenial, is a mystery. I became slightly acquainted with the tent worm, though it called only long enough to give us the parting blessing this year. Then there is the cut worm. "From whence cometh it?" It is like the wind. "I cannot tell from whence it cometh or whither it goeth," but it is to be hoped that they have gone so far that they will never return. This year their names were legion. Then there is the chinch bug, quintessence of the bed bug; the only difference I can see between them is that one derives its sustenance from the human body while the other subsists on the sap of cereals. And so we might enumerate. It is like the writing of books, there is no end. Every year new insects come onto the stage of action, until it seems as though the plagues of Egypt are about to be enacted over again. So I would advise every member to buy Prof. Green's "Amateur Fruit Growing" and arm himself with all the paraphernalia of war, for you are bound to fight bugs all the rest of your mortal life.

In the Horticultural Gleaner, R. H. Price gives a method of protecting fruit trees from ravages of rabbits, etc. His way would certainly appear a practical and efficient one, since he has saved one large orchard by the treatment, while others have used it with great success. A gallon of common white lead paint of the ordinary thickness to be used on buildings is taken, and to it is added one tablespoonful of Paris green. The two are well mixed together; after which the dirt is removed for an inch or so around the base of the tree, and a good coating of paint applied to a height of eighteen inches on the trunk. A rabbit comes along, gnaws off a piece of the bark and dies. Insects, particularly borers, attempt to drill through the painted wood and die. The average cost of this treatment for each tree the correspondent estimates at 1½ cents. As they require painting over only every two years the process is comparatively inexpensive.—*The Market Garden*.

DEGENERATION OF FRUITS.—Will varieties of fruit degenerate? has long been an open question with the fruit growers of the Old World, the tread of opinion being against the Knighton theory; but the opposition to it has been mainly on physiological grounds. Since the discovery of the operations of minute fungi, which after a while find a certain variety to be a good field for their operations, and which then travel with the young plants raised, the objections are weakening. Physiologically, there is no reason that a variety should wear out, but in practice it is found that something happens, and new varieties are necessary.—*Meehan's Monthly*.

CLIMATIC MODIFICATION OF FRUIT.**A. F. COLLMAN, CORNING, IOWA.**

Mr. President: Your beautiful city is very near the geographical center, east and west, of the western continent, and is one of the best in the central states. Your railroad facilities are among the best. Your state is noted for its fine lumber and mineral products and its broad fields of golden wheat. Connected by the Mississippi to the Gulf of Mexico and by the chain of lakes to the Atlantic, you can load your famous whalebacks with golden wheat and feed the people in the old world. Your state is noted for its educational and religious institutions, and its people for intelligence and refinement. And as we climb the mount and look over into your beautiful state, we cannot help thinking that you are occupying the lovely valley God has given to a chosen people.

The climate of a country depends chiefly upon its latitude and elevation; it is also affected by the ocean and its currents. From the Japan current a stream of warm water flows northward with a similar current from the gulf stream, which tends to moderate the cold of the arctic region and to balance the cold currents flowing south. The general flow of the ocean current, westward in the tropical and eastward in the temperate regions, coincides with the atmospheric movements. In the tropics, the winds blow to the west and are called trade winds; in the temperate zones they blow to the east and are called return trade winds. The temperature of the atmosphere is regulated by winds or currents of air, while that of the ocean is regulated by currents of water. All is the effect of the combined action of heat, cold and air. Heat lightens the water, that the air may lift it from the ocean and lakes; the wind carries it in the form of vapor over the land; the cold makes the vapor heavier than the air, and then it falls in the form of rain, dew, snow and frost.

Minnesota is very favorably located, being near the geographical center, east and west, and at the head of the great Mississippi valley. The vapor from the Atlantic and the lakes is carried west, from the Pacific east and from the Gulf north, and meets the cold current of air from the north that follows the water in the two great rivers to the Gulf. This cold current cools the atmosphere, and vapor falls in the form of rain, which accounts for the fact that we have a greater rainfall in the Mississippi valley or the central states than in the eastern or western states.

In Minnesota the average rainfall is about twenty-six inches. The southeastern counties of Minnesota and a strip along the eastern line as far north as Duluth receive about thirty-five inches. Iowa receives about thirty-five inches. The northern half of Missouri has an average of about thirty-five inches; the southern half being nearer the Gulf receives more than forty inches yearly. Illinois, northern half, thirty-four inches; southern half, forty inches. In Nebraska the range is very great, like a shingle with the butt end eastward; along the river and western end, very thin; in the southeastern section the range is twenty-four to thirty inches. In

respect to humidity of the air, Nebraska and Minnesota have a lower average per centage than the other states mentioned.

We find that moisture is necessary for the development of fruit. In a dry climate the fruit is small, but fair in appearance and quality. Moisture, sunshine and a high state of cultivation are necessary to produce fruit that will command the highest prices and carry away the first premiums at our great fairs.

During our late Columbian Exposition I was kept busy the last thirteen weeks at the great fair in Horticultural Hall, to do the best I could to show the horticultural products of my state. Duties called the superintendents connected with their work from one end of the great hall to the other almost daily and sometimes many times a day, and I found it a pleasure to take notes and study fruits along my line of duty. We had a chance to study fruits in latitude 40 and 45, from the Atlantic to the Pacific, from Maine to Oregon, through the entire fruit belt of our country. In Maine, New Hampshire, New York, Ontario, Michigan, Wisconsin and Minnesota, where the growing season is comparatively short, with a low temperature but protected by a humid atmosphere, we found excellent fruit, and the superintendents all spoke well of the countries they represented. Now we reach Illinois and Nebraska. Of course, modesty prevents us from saying very much about our own state, but we like our home and ship millions of bushels of fine apples east, west, north and south. Southern Montana, Wyoming, Colorado, Utah, Idaho, Washington, Oregon, Nevada and California, all made fine displays of fruit. Where lands had been irrigated, the fruits were very large and fine in appearance, but were *poor* in quality and color compared with the fruits in the Mississippi and Missouri valleys, where the rainfall is sufficient to mature good crops of grass and our Indian corn. Moisture is necessary for the development of fine, showy fruit, but too much moisture will tend to produce large, coarse fruit of poor color and quality.

Fruits may be modified by selection and acclimation. We may select choice varieties and, like our friend Gideon, plant seeds that *may* produce varieties that will prove satisfactory in tree and fruit. I would not discourage planting seeds, for many thousand varieties of fruit have been brought to notice in that way. But we know from sad experience that the pathway to success along this line is strewn with *many thorns*.

Again, fruits can be modified by crossing and hybridizing. This we think is practical and comparatively certain. Perhaps it would be interesting to describe the process.

To prepare the pollen.—Just before the flower opens, extract the anthers and place them in a sealed envelope and allow the pollen to ripen in a warm room from twenty-four to thirty-six hours. It may be kept several days or even weeks and sent thousands of miles.

For the sake of argument, we will take the Duchess as the standard of hardiness. We know the fruit for culinary purposes ranks very high, and the tree for hardiness is a model, its roots extending deep into the earth after moisture, and its leaf is perfect. In the Duchess we find about as many good qualities as in any one of our

hardy varieties, but we believe the fruit of the Duchess can be improved by crossing it with some of our American apples of high quality, and the hardiness of the tree maintained. We have plenty of good summer and fall varieties, so we should turn our attention to the production of winter apples of good quality and hardiness of tree. Some of us may not succeed, but let us all try, and some one will produce the apple for the million.

The want of definite information as to hybrid, or cross-bred offspring of fruits, is very great. As we trust the hybridist, we must insist on his being a trustworthy and skillful operator before we place confidence in his records. For example, the flowers must be carefully emasculated before there is a shadow of a chance that pollen can have escaped from the anthers. The female flower must then be carefully covered with a paper sack, and in about twenty-four hours the pollen of the intended male parent (after having been prepared) must be applied with a *clean* camel's hair pencil, and the sack carefully replaced and fastened with fine wire to prevent insects from entering the sacks. Plant the seeds produced by the cross, and you have a new variety that may be valuable. A scion from the young tree may be cut and top-worked on some hardy, bearing tree, and in about three years you will see the result of your labor.

We find the rainfall and sunshine in the southeastern counties of Minnesota and a strip on the east side as far north as Duluth, is sufficient to develop fine, showy fruit of good quality. With proper care in selecting location and hardy varieties, the country named is equal to any fruit lands found in the great Mississippi valley.

CATCHING MOTHS.—For an entomologist who wishes to study the owl-moths of any region in a short time, there is no better method than to "sugar" for them. This is the technical name for applying a bait composed of the cheaper grades of molasses, sugar and vinegar. This mixture if kept warm will soon start a vinous fermentation, which seems to have a wonderful attraction for all owl-moths that take food in that stage. For a number of years sugaring was carried on by myself at the Agricultural School, and immense numbers of moths were captured. The above mixture, which is of a treacle-like consistency, was brushed against the trees, and proved such an attraction that on certain evenings moths came in such numbers as to appear like swarming bees.

Strange insects are sometimes caught at such baited trees, insects that have never been found breeding in the north. For instance it is a common occurrence to see large numbers of cotton moths fluttering around such baited trees. They are found only very late in the autumn, and always appear as if freshly issued from the pupa. This is very remarkable indeed, when we consider that such insects must have flown over that tremendous territory separating the wheat belts of the north from the cotton belts of the south.

—*Minn. Ex. Station, Bulletin No. 43.*

FERTILIZATION OF THE SQUASH.

(The sketch and engraving, with that following on "Celery Transplanting," are taken from the advance sheets of a work on "Vegetable Gardening," by Prof. S. B. Green, now in press.—Sec'y.)

"Figure No. 1 shows the two kinds of flowers found on the squash. Squash flowers are practically the same in construction as the flowers of the cucumber, pumpkin, melon and gourd. The piece of vine in the center of the figure has attached to it a pistillate female flower to the left, which has a short stem and shows clearly the young squash; on the right of it is a staminate (male) flower, often called false flower, attached to the piece of vine. On the extreme left and

Figure 1.—Fertilization of the Squash Blossom.

separate is shown the pistillate flower with corolla removed, showing the pistil, which is the part that receives the pollen. On the extreme right is a staminate flower with the corolla removed, showing the stamens in a column in the center. The purpose of this flower is solely to produce pollen, and after doing this it dies. At the base of the stamens will be noticed a dark spot, which leads to the honey gland, in trying to reach which the honey bee becomes covered with pollen; this is transferred to the pistil of the pistillate flower by a like process."

TRANSPLANTING CELERY.

(From "Vegetable Gardening," by Prof. S. B. Green.)

"It is generally best to transplant celery plants temporarily when very young from the bed where the seed is sown to boxes or to other beds where they will have sufficient room to develop properly until large enough to be moved to their quarters in the field. The effect of this early transplanting is to encourage the formation of fibrous roots; such plants are much more certain to live and do well when moved to the open ground in hot weather in June or July than plants that are grown without being transplanted when young.

Figure 2.—Effects of Transplanting Celery.

"Figure No. 2 shows on the left the effect of this transplanting on the roots of the plants in increasing the root system; on the right is shown plants as commonly grown without being moved until they are to go into the field. In this latter case little more than a large tap root is left, and the plants often fail unless the conditions are very favorable. In each case a plant is shown with full top and also one which is properly trimmed for transplanting."

BEFORE AND BEHIND THE SCENES, OR WHY FRUIT GROWING HAS OFTEN BEEN A FAILURE IN MINNESOTA.

J. S. HARRIS, LA CRESCENT.

The subject of this paper was of my own choosing. Having been a fruit grower and tree planter within sight of my present location more than forty years with very diversified experiences and in correspondence with the most prominent and successful fruit growers of Wisconsin, Illinois, Iowa and this state for about thirty years, and having largely made the work of my life experimental, it occurred to me that I might handle this subject in a manner that would prove interesting to you and throw a little light upon the causes that have led to so many failures in fruit growing in this region. But I find—and I think you will agree with me before I am done—that I have greatly overestimated my ability. I shall endeavor to confine myself in this paper chiefly to orcharding, or growing of tree fruits.

Many of the failures in the earlier years were excusable and at the time unavoidable, and their causes should occupy the place "before the scenes" until such time as they become known and can be avoided. At the date when our first orchards were planted there was not any guide whatever for the would-be fruit grower. No matter how learned and expert a horticulturist he had been in his eastern or more southern home, it availed him nothing, for the soil and climate of his new home were entirely different from that of the one he had left, and he soon found that much had to be learned by experience and original observation. He had to learn that varieties that succeeded the best under certain environments were uncertain or totally worthless when surrounded by those that were entirely different, and that it was not safe to plant a tree that could not stand a hundred degrees of summer heat and endure a temperature of forty degrees below zero. Unfortunately for him, the difference in the hardiness and adaptation of varieties were unknown here, because no previous tests had been made, so he had to work out the problem under great difficulties. Another cause of failure in the early days was the distance that intervened between the places where the trees were propagated and raised to a suitable size and where they were to be planted, and the slow and uncertain facilities that existed for their safe transportation, it often consuming several weeks of time, and the trees arriving so late in the season and in such a condition that it was about useless to set them out, for the little life left in them would flit away before many winter storms had swept over them. Another cause was the injudicious selection of the site for the orchard. Our first orchards, wherever it could be done, were set on southern slopes or in warm sheltered nooks, which experience has since proved were the very worst locations for an orchard, and that the cool northern slope and the high, airy grounds were much the best. Another trouble was that time could not be taken to give the ground suitable preparation and that the mulchings, prunings and protection suited for the climate were not generally understood.

Today there exists no valid excuse for failures from the causes mentioned, because the causes need not necessarily exist. The best of facilities are afforded every man to learn how the ground for an orchard should be prepared before the trees are planted, and when, how and where they should be planted and cared for to bring him the best results. It has become known, too, that some varieties are more hardy than others and can be made to thrive over a considerable portion of the Northwest, which they are doing, and there is no excuse remaining for procuring trees from long distances away and from milder climates, for we have ample nurseries right at home or easy of access and in which are propagated only the hardiest and best known varieties—and even distance has been almost annihilated by the facilities now afforded by railroads and express companies.

Under these improved conditions there are a few men scattered over the state who are making commercial orcharding a satisfactory success, and the number who raise a considerable portion of the fruit consumed in their families is increasing in a ratio about corresponding with the growth of our society. Such are generally liberal minded, energetic men and intelligent, careful cultivators, continually experimenting and always profiting by the success and failures of others; had it not been so, the Minnesota State Horticultural Society could not have been kept alive and growing in influence and usefulness under the difficulties that had to be encountered and surmounted. But the successes are not what they ought to be. Every year there is paid out for fruit trees and plants by the people of the state from one hundred to one hundred and fifty thousand dollars in hard earned money, that never net one-tenth of the purchasers one per cent on the investment, not counting the time and labor of cultivating and use of land anything. For some of the causes for these losses or failures, we must look "behind the scenes:"

First. Many people do not take pains to learn what varieties are hardy and adapted, and then set no others.

Second. Altogether too many people procure their trees of agents of nurseries located long distances away and that frequently are only associations of middlemen who are not responsible and who procure their trees where they can be purchased the cheapest, regardless of quality, and besides rely too much upon the agent's "say so," about their hardiness. Experience has repeatedly shown that a two year old tree grown to the size of a four year old on the rich soils south of us will not live as long or do as well as one of the same age or four years grown on soil and under conditions like those in which it is to be planted.

Third. Much loss comes from purchasing too freely of novelties that have had no time or opportunity for being tested in regard to their hardiness or adaptation to our climate.

Fourth. Thousands of trees are lost every year through the carelessness of the planter. Some are allowed to lie around and dry up too long after they are received and before they are planted; some are set in holes and carelessly filled around with clods, sods and whatever is most convenient; some are set too deep in tenacious clay soil that has no drainage; and mulching is too often neglected.

Nor are these all the causes of failure that we may discover lurking "behind the scenes." Too often orchards are not securely fenced against the incursion of farm stock, or fence gates are left open and the farm animals break in and mutilate and destroy the trees. The enclosed orchard is too often found a convenient place for turning in the horses for exercise and baiting the cows when the fall pastures are short and in the spring before they are fit to turn on to. Every tree that is severely browsed, has the top broken off or is otherwise mutilated by cattle might better be dug up and thrown away than to attempt to nurse it into usefulness. Even allowing the ground to be tramped in the late fall or early spring is dangerous.

Many orchards are hopelessly ruined while young by raising grass and grain among the trees without even mulching or digging over a space about them. Every winter great numbers of trees are lost through being gnawed by mice and rabbits, when with a spade in one minute of time a mound of earth may be raised about the base that is an effectual barrier against mice, and it costs but little to bind straw, cornstalks, lath or cloths about them to protect against rabbits. In a few instances we have seen orchards that had been planted and cared for and had yielded good fruit, by men who are now disabled by age and infirmity, totally ruined through the thoughtlessness of younger members of the family and hired help, in allowing them to grow unkempt and then throwing the grounds open to common pasture to get rid of the labor of mowing down the weeds.

After looking "behind the scenes," is it any wonder that orcharding is no greater success in the Northwest? The success of a great number of our farmers in growing small fruits is about on the same scale. Good money is paid for plants, they are set in the same field where other crops are growing, they are hoed and tended all summer and look promising in the fall; then the cows, colts and, sometimes, the hogs are turned into the field to bait, and the berry patch is soon ruined for next year's crop by the plants being burned off or trodden into the ground, and next year the owner buys his fruit or goes without and will tell you that berries will not grow for him.

MULCHING TO RETARD MATURITY.—Careful investigation and thorough inquiry lead to the following conclusions:

1. The early bloom of fruit plants depends very largely upon the appropriation of foods stored in the twigs, and it is more or less independent of root action. This is proved by direct experiment and by study of the physiology of plants.

2. It must follow, then, that the temperature of the twig or branch must be reduced if its vegetation is to be retarded; or, in other words, the top of the plant, as well as the soil, must be mulched, and in practice this is possible only with strawberries and other very low plants or those which are laid down during winter.

3. There is danger of injuring plants by heavy mulch which is allowed to remain late in spring. If it is desired to retard flowers or fruit by mulching, the practice should not be violent and the plants should be carefully watched.

4. Many strawberry growers are able to delay the ripening of fruit by mulching from two days to two weeks; but a week's delay is usually about the limit of profitable results. PROF. L. H. BAILEY.

REPORT ON SMALL FRUITS.

MRS. A. A. KENNEDY, HUTCHINSON.

Strawberries. Crescent and Charles Downing and Finch's Prolific have given the best satisfaction. I have tried Bederwood for three successive years; the plants look strong and vigorous, but I don't think they have borne two dozen berries. It may be owing to the dry seasons and not to the plants, as none of our plants have amounted to much.

We have had the best success with the Cuthbert and Turner raspberries, as far as I know, in this district, though the Marlborough and Shaffer have done well in some localities. Of black raspberries, the Ohio and Doolittle have borne heavily in spite of the drouth, Gregg and Souhegen have proved to be too tender, and Mrs. Bell says they want too much petting. The Ada, Kansas, Palmer, Progress and Alden I have on my grounds, Prof. Green sent to me for trial this year; they all did well; the Alden bore the largest berries I ever saw.

Currants do well, but as far as I know very few know what kind they have; they have been handed down from one generation to another, and nobody knows where they came from, but some of us know where they will go to—they will run out if they are not replaced by some standard varieties. Buffalo berries are a success with us. Mr. Barrett sent me some plants three years ago. I planted them in my garden and was sorry I did not put them in my flower garden when in bloom. Their loveliness is beyond description, and when laden with fruit they are not much less so. Grapes. The Lady has been a failure; Moore's Early, Concord, Eaton and Niagara have done the best.

The pears Prof. Green sent for trial looked perfectly hardy and have never winter-killed but have never produced any pears. I also have some apple trees from Mr. Pearce, of Chowen, he called them Nos. 1, 2 and 3. They are free from blight so far and are in bearing. The Peerless, as far as I know, are all doing well and looking nicely. I am going to try and do a little missionary work in this district and see if I cannot prevail upon the people to get fruit that they know the names of and then mark them and keep a record; then we will be able to make intelligent reports. Unless we can succeed in doing this, our reports will be meager and unsatisfactory.

A THORNLESS ROSE.—The Paul Neyron comes the nearest to being a thornless plant that we have. The canes, or stalks, as well as their branches, are very free indeed from prickles, and the wood is handsome, with a beautiful smooth finish. The leaves are large, clean and glossy, and the flower is perfectly magnificent. It is claimed that this rose is the largest rose in cultivation. Its color is a clear deep rose, and the fragrance is exquisite, and taking into consideration these many valuable points, we see that it is a grand rose. Being perfectly hardy and vigorous, it can be safely recommended for general planting, and should be in the collection of every amateur and professional florist.

MY ARTESIAN WELL.

WM. DANFORTH, RED WING.

The immediate incentive to the construction of our artesian well was the dry summer of 1894, which was productive of poor vegetables and a very few discouraged flowers, and left dying trees and fruit plants ill prepared either for winter existence or next year's fruiting.

The well is situated two miles from Red Wing on a plateau of the same height as the city, fifty feet above the Mississippi. It was drilled in March of the present year (1895). There was a layer of earth to a depth of thirteen feet, sand rock to ninety feet, shale to 225 feet and then sand again the balance of the distance, the last twenty feet being colored with iron. It was made with a six inch drill. Artesian water was reached at 225 feet below the surface.

Drilling was continued to 496 feet. At this point the temperature was 51° and had been rising one degree for every fifty feet in depth. The flow was sixteen feet above the surface and had increased one foot for every seven in depth. The discharge is eighty-five gallons a minute. The total expense has been about five hundred dollars.

The well was completed so late that very little could be done for the early fruit. By July it was in running order. A two-inch iron pipe was run north of the well to the summit of a ridge, thence along the ridge to and through the strawberry field. This ridge is about seven feet above the well. The rows lie north and south, dropping from the ridge to the north one foot in one hundred and four feet in one hundred to the south.

Along the pipe about every one hundred feet are Ts, where the hose can be connected. In the strawberry field we use a fifty feet length of two-inch hose to lead the water to troughs, by which it is distributed to the plants, irrigating about eighteen rows at once. We could not apply directly from the hose on account of the soil washing. The troughs are V-shaped and made from common fencing, with a small hole for each row. We generally changed the troughs once in twenty-four hours.

We went over our strawberry field in August and in October. In a few places where we did not get water on the plants, they do not look as thrifty as the balance of the field. The vegetables were improved by the use of the water, and the flowers were especially fine.

Mr. C. L. Smith: How long has your well been running?

Mr. Danforth: This year we got the water running about two weeks before the strawberries came into bearing, and we could not see much difference between those rows which were watered from the balance of the bed, but this year our plants were in very poor condition in the spring. We estimated we had only about thirty per cent. of the plants we generally had.

Pres. Underwood: What was the cost of the well?

Mr. Danforth: The cost of the well itself was \$350, but we paid out over \$150 for pipe and incidentals connected with it. We have about one hundred feet of two-inch hose.

Mr. Kimball: Did you have it put down by contract or day labor?

Mr. Danforth: We had a contract. They were to give us an 18 foot head of water, but they got down into rock and gave us only a 16 foot head.

Mr. Bunnell: Do you think two inches is large enough for irrigation?

Mr. Danforth: Our inside casing is three inches, and then we use two-inch hose. We never use the full flow of water. We could irrigate about one-third of an acre a day, and we let the water run without any attention.

Mr. S. M. Owen: How much do you irrigate?

Mr. Danforth: We have been irrigating about three and a half acres.

Mr. Kellogg (Wisconsin): Did you get an immediate benefit?

Mr. Danforth: We commenced on three rows of strawberries, but we did not see much benefit.

Pres. Underwood: Did you have rain?

Mr. Danforth: Oh, yes, we had showers occasionally.

Mr. Gardner: Did I understand you to say you did not see any difference in the fruit or the plant?

Mr. Danforth: We can see a difference in the new bed that is going to bear next year, but on the old bed that bore last year's crop we do not see much difference.

Mr. Gardner (Iowa): If they have a frost when the plants are in blossom, and the buds are killed, those buds that come on afterwards do not amount to much, and it would not make any difference whether you water or not, you would not have any fruit any way.

Mr. Collman (Iowa): I would like to tell what I saw at the Elgin Nurseries last summer. The owner irrigated his nurseries by means of underground tiling, and last year while everything else was drying up he saved his entire crop of trees, and he thinks it is by far the best system of irrigation.

SOME THOUGHTS ON GARDENING.

GEO. C. STOUT, LAKE CITY.

Mr. President, Ladies and Gentlemen:

Your most excellent president has lately selected me to give some rambling thoughts on gardening, thinking that the least fluent speaker or writer would be made eloquent by his subject, but I assure you the reverse is the case. The great possibility of my subject overburdens my poor faculties, for if I had the tongue of men and angels combined I should fail to do justice to my theme. Gardening has many worthier and far more eloquent champions than myself. In our journey through life, wherever we are or whatever our situation or avocation, we are continually learning lessons, and one of the most important to learn or be acquired is to learn how little we know and how much we do not know. I think this applies very forcibly to me and gardening.

Before deciding on a spot for a garden, we should be cautious in selecting the locality. Mistakes in this matter are often the cause of non-success, when all other things are favorable. We also should select our grounds near some good market, as the cost of marketing our crop is a big item in our expense account, and we have a better chance to take advantage of prices which sometimes are variable. In selecting land for a garden, do not be deceived by any one telling you that if not naturally good the soil can be made so by cultivation and manure. These, of course, will help, but only as education improves the shallow mind. Luxuriant crops can no more be raised from a thin and poor soil, no matter how much it is cultivated, than fertile ideas from a shallow brain. In selecting your garden, see that the soil is a good, deep loam, neither sandy nor clayey, as deep as you can get it, through which water will pass freely. On this you can raise abundant crops under good management. In laying out your garden, you should divide it up by the number of feet, giving to this or that tree, flower, vine or vegetable the number of feet which you intend to devote to each and the respective places they are to occupy. This should be the work of a day and should be carefully done, as work well done is twice done, and you will not have to go over your work the next day to mend the weak places; besides it gives you a feeling of solid self respect to look over your work when well done, and it commands the respect of your neighbors also. There is nothing so encouraging as successful experiments to the gardener and nothing so discouraging as frequent failures. Therefore, think well and work well, and you will not fail of making a good gardener who will not be ashamed of his profession. What can be more interesting than to investigate the habits and growth of fruits and flowers and to help unfold the riches of the vegetable kingdom and to watch their growth and development. It is man's natural avocation to till the soil—in all the world of nature there is nothing like it. Tilling the soil is one of the most honorable, healthy and desirable pursuits vouchsafed to man. It is pluck that is needed to make a good gardener, with plenty of bull dog tenacity of purpose and stubbornness of perseverance. This wins the battle.

Nature demands intelligent industry, and she tempts us with opportunities of financial reward.

Gardening, or soil culture, in the widest sense of the word, includes a hundred or more pursuits that call for the thoughtful brain, the inventive wit and skill. There is no employment which demands a closer observation nor so fine a sense of climatic changes nor more infinite knowledge of the life, growth and habits of fruit, flowers and vegetables. It has been said by one of the old writers on this subject that he who could plant a fruit tree and supply it with nourishment and protection through the years that intervene between its root existence and its full harvest of fruitage, is master of a realm of cause, of effect, of influence, of tendency, whose domains are as large as the fruit bearing zone of the world. Mr. President, he who can take a piece of sterile land, impoverished and worn out, and plant it into a garden, and by industry and intelligent manipulating of the soil make it productive and to blossom like the rose, has won a victory over adverse circumstances prouder than the triumphs of the sword. The love of flowers, fruit and vegetables is natural to all. The Creator of all has ordained man for the cultivation of the soil. Thus we are in a manner, like our first parent Adam, made gardeners. I have often thought of the transports of joy that must have filled the heart of our first parent as his delighted eyes first luxuriated on the clustered beauties that decked his Eden bowers. Although we may be denied from the beauties of Eden, we still inherit some of the beautiful flowers and fruit. Who does not like them? We are told that Solomon in all his glory was not arrayed like the beautiful lily. Dormant indeed must that mind be that fails to derive a feeling of elevated and refined delight from the contemplation of those pearly gems that grace the bosom of our mother earth, the jewelry with which heaven has adorned her.

Barren indeed this world of ours would be
Deprived of the sweet smiles of the beautiful flowers.

Who would not be a gardener where nature is so bountiful! She gives us the soil, we try to help her by working it; she keeps the soil moist as we mellow it up; she then lets the air pass into it with its fertility, which she has gathered from the neglected barnyards and cesspools of the land, and this fertility she leaves with the soil. And thus the gardener and nature are working together trying to help each other; thus are our gardens improved and made productive. The more we feed and work the soil of our gardens, the more will nature assist us, and the better will our crops and gardens be. The truth is we are only helping nature at the best, and she pays us well for what we do for her. If we deal generously by her, how well she pays us back—

With great waves of plenty,
Rolling up their golden harvest at our feet.

The question is often asked of us, "would I make a good gardener?" Yes, if you have plenty of mother wit and are willing to put in the same energy and hard study that you would to make a good mer-

chant, lawyer or doctor, but you must not think that you have only to plant and sow the seed to reap big crops and prices.

You will have to pull off that coat,
For you will find plenty to do.
You will have no time to sit down and growl,
But you will just have to "get up and howl,"
And "paddle your own canoe."
Perhaps you will have some very bad luck,
That is the time to show your pluck.
You cannot stop to sit down and complain;
You will have to get up and shake off the dust,
And then go at it again.

The problem of creating wealth from the soil is no less difficult and laborious than any other business pursuit, and he who thinks otherwise will learn at the end of sad and dear experience that he was mistaken. Therefore, you want to study hard and get all the information you can from practical men, and don't be afraid to get all the good ideas you can from writers on this subject. Work hard, study hard and keep your eyes wide open, and you will hardly fail.

Mr. Stout: *Ladies and gentlemen:* This is the first meeting of the kind I ever attended. I have been in the shoddy business, and I have talked all my teeth out trying to make people believe that shoddy was as good as all wool. For the last three or four years I have been working in the garden. If you were out in my garden where I work and wanted to know anything, I could most likely tell you what you wanted to know, and at any rate any time you come out I can talk you to death in a few hours time. But to get me up here to talk is different. I would like to ask the gentlemen here if they think there is any virtue in coal ashes.

Mr. Pearce: No, there is not.

Mr. Stout: Well, now, just hold on; let me tell you something. A few years ago I bought a peck of some new kind of potato, and I set them aside and forgot them, and when I found them again it was pretty late, and I had no place to plant them. I had a sandy knoll, mixed with clay, which I thought was good for nothing, but I covered it with coal ashes and put in my potatoes and covered them over, and I noticed after a while that the bugs did not bother them; I asked myself the reason why the bugs did not get after those vines, for it was a fact they let them alone. The vines were not as thick as my arm, and there were no weeds among them either; once in a while a big weed would come up, but on the whole I thought those potatoes would not amount to anything. One day I went to work and dug up some just to see what they were like, and the way those potatoes looked made my eyes stick out like the

nigger's did when he fell in the barrel of lard. And when I came to dig them in the fall, from that one peck I planted there I had eleven bushels of as nice potatoes as you ever laid eyes on—and if those coal ashes did not help them just tell me what did? Now I will tell you another thing. I wanted some early potatoes to plant, and I finally found a man who had some sort that he claimed were good, and I guess they were sprouted a foot long, but I got them and paid a dollar a bushel for them—and I had a piece of ground that I covered over thick with leaves from maple trees. When I was in town and saw a man raking up his yard, I would get the leaves and haul them home, and then I would cover the ground thick with leaves and put coal ashes all over. I plowed that stuff under I took pretty good care of the potatoes, and when I came to dig them in the fall I found I had forty bushels and three pecks from that one bushel. About that time I met a man, and we were talking about potatoes, and he says, "Just come out to Dakota if you want to raise potatoes." And I says to him, "Just you come out here." I showed him the potatoes I had raised, and he said, "By gosh! That beats Dakota." Now, if coal ashes ain't good for anything, I don't understand what made those potatoes turn out like that.

Some one wanted to know how it was I had such good luck with tomatoes. In the first place I make a hotbed. I pile up about three or four feet of manure, and then I put on, say, four inches of soil. And if I get in a hurry, and the manure doesn't heat, it don't worry me a bit; I just heat a few kettles full of water, and I stick a funnel in the manure and pour that hot water in, and the bed is not long in getting up a good heat. I plant my tomato seed in that hotbed, and after they are about four inches high I reset them in a cold frame. That is a sort of a hotbed anyway; I put manure in the bottom. I leave them in there until the plants get about eight or ten inches high. I take them out again, and by that time they have pretty good roots on, and I make a bed right on the ground and transplant them again, and when I get ready to set them out they have small buds on. I put out four rows across the garden three rods long, and they were all out in blossom, and one night it looked as though it was going to be pretty cold, so I got a lot of old stumps and things together and made a little smudge. Where I got hold of that was down in New Jersey. One year there was a man there that had a very fine peach orchard; he thought it was getting pretty cold, and he went to town to a

tannery and got a lot of dry tanbark, and they hauled that out there and put it in piles around his orchard, and then he went all around those heaps around his peach orchard and set them afire, and that man was the only man in the county that had a peach. I tried his game, and it came pretty cold that night, and wherever that smoke blew there was not a tomato hurt, but the smoke only blew over a few, and I mistrusted there would be trouble, and when I got out in the morning I saw where the trouble was; I saw that the minute I got there. So I pitched right in and reset those that were killed, and by the time anybody came around everything looked just as nice and green as though we never had any frost. One man says to me, "I'd like to know why you are any better than the rest of us." I couldn't tell him. I never told them that I got up bright and early and reset those that were gone. Now I want to give you a conundrum. Why am I like a new kind of squash I've got? Give it up, eh! I am inclined to sport.

THE NEW STRAWBERRY CULTURE.

L. J. FARMER, PULASKI, N. Y.

(Reference was made to this article in the April number, but it appears to be of sufficient value to print entire. Sec'y.)

The "new strawberry culture" is to take up the plants in the spring and instead of setting them out permanently at once to set them in a small bed close together, about twenty plants to the linear foot, and shade from the direct rays of the sun for a few days until firmly established. A furrow about eight inches deep is made with a spade, the plants are trimmed of superfluous leaves, their roots shortened to four inches and then set closely to the land side, hauling earth up onto the roots, filling the furrow. The little rows are made about a foot apart, except once in a while when a row is omitted for a path to facilitate moving among them in watering and spraying. Fine rotted manure is put between the rows for a mulch and to add fertility. The plants are kept in this bed about a month or six weeks. Meanwhile they are watered as often as necessary and sprayed with Bordeaux mixture once a week to free them of the leaf blight. When ready to set out, the ground is soaked about the plants, and they are taken up in pans and carried to the field. While in this bed new roots start out on all sides of the old ones. These cling to the soil, and when transplanted earth is taken along with the plants, and they grow right along, receiving no check in transplanting.

The advantages of this system are many. As is well known, if you set plants out permanently early in April, the ground cannot be properly prepared because it is too wet, etc. Set out so early, they

apparently stand still and become thoroughly infested with leaf blight, but the weeds do not fail to grow unless a great amount of work is laid out on them.

Strawberry growers all know that the first six weeks after the plants are set is the most expensive period. You must be ever vigilant or the weeds get the start, especially if the plants are weak and debilitated by leaf blight.

By our new method the field is plowed and worked over with harrows and cultivators for about six weeks before setting out the plants. All weed seeds are destroyed, and if the land is infested with grubs they are brought to the surface where birds pick them up. In our locality we keep the plants in the beds and do not set them out permanently until about June first. At this time the soil is warm, and, if the last harrowings be very shallow, the soil will be moist, and when set out the plants will boom right along.

One of the greatest advantages of this system is that it facilitates the spraying. We find that it is absolutely necessary to spray with Bordeaux mixture if we are to keep plants healthy. It is expensive to go over eight thousand plants and spray them if they are spread over an acre. It takes more time, and much liquid is wasted. When set in a bed closely together, it can be done easily and cheaply every week, and the leaf blight is killed before the plants go to the field. Ordinarily, I do not believe they will need further spraying the same year and hardly ever in the fruiting year if plants are set on clean soil not infested with leaf blight fungus. They will, however, need further spraying if strawberries have been grown on the same soil year after year.

Farmers are always busy getting in spring crops at the season strawberries are generally set. By this plan they wait until the rush is over. A man will "heel in," or set closely together, ten thousand plants in a day, while to set out permanently an ordinary man can only handle about two thousand plants. If treated right, nearly and often quite as good a growth may be secured as when plants are set by the old method in early spring. I have seen rows nine feet wide grown in one season from plants treated in this manner.

If plants are wanted for setting the middle or latter part of June, they should not be heeled in the little bed until about May 15th or thereabouts. The earlier you intend setting out permanently, the earlier they should be heeled in, and *vice versa*. Of course, all blossoms and runners should be removed from the plants when they are set closely in the heeling-ground, and when finally taken up all old leaves and any superfluous foliage should be clipped off.

Practical experience is worth more than theory, and for the benefit of those who might otherwise think this something that had been gotten up simply because it was new, I will say that we have been practicing this plan with great success for several years.—*Western N. Y. Horticultural Society's Report of 1895.*

COMMENTS ON CAPTAIN CROSS' FORESTRY PLAN.

H. B. Ayres, Esq., one of the committee appointed by the Forestry Association to investigate and report to the association upon the suggestion of Captain J. N. Cross for a plan to induce the pine land owners to deed their non-agricultural cut-over pine lands to the state for the purposes of a natural and inexpensive re-forestation of the same by simply keeping the fires out, submitted the plan to Prof. C. S. Sargent of Harvard University, who is a member of the national committee of forestry appointed by the Smithsonian Institute on the request of President Cleveland to formulate a plan of national forestry, and who on commenting on Mr. Cross' plan wrote to Mr. Ayres as follows:

"With regard to the matter of the state of Minnesota receiving and holding stump lands presented to it, I should think the best way would be to get a board of trustees appointed to hold such lands. The danger in such matters is always that of political interference. If you could get a good non-partisan board of three or five with authority to fill their own vacancies, the future control of these lands would be entirely outside from politics, provided the first members of such a board, who would have to be appointed by the governor, were good men and not politicians. The trouble always has been in New York that the forest commission has been a political body. This fact has been a very serious damage to the interest of the state and if Minnesota is to adopt a plan for acquiring and caring for state lands, it will be wise to use every effort to avoid the mistakes made by New York. I should be very glad to hear from you again on this subject, which is of very great national importance."

William M. Canby, Esq., an eastern capitalist, greatly interested in forestry, writes to Mr. Ayres concerning Mr. Cross' plan as follows:

"I am glad to hear from you again. So far as I can judge the plan suggested by Mr. Cross is good as a start, but your people will have to learn that forestry is a business and has to be conducted on just as good business principles as any other enterprise. Forestry means not only to keep a tract in wood land, but to make it pay as a wood land; and this means that it must be looked upon as a crop, and that eventual thinning out is to be done with due regard to the growing timber so as to get the largest returns possible without trespassing upon that which is to come. I do not know exactly what "dead and down timber" means, but what you ought to aim for is the greatest amount of timber that is alive and standing but ripe; and if you are wise you will not sell it on the ground to be removed, but will see that it is got out without injuring the balance. I have not time to write more than this. Prof. Sargent and I expect to make a visit to one old grove in Montana, north of Flathead lake, this summer."

Obituary.

ABBIE GUILD FORD,

DIED AT SAN DIEGO, CAL., AUG. 4, 1896.

Many hearts will mourn in sympathy with our old friend, L. M. Ford, at the unexpected death of the companion of his life. Only a few weeks since, in a very bright and cheery way, he spoke of the happiness of himself and wife and the pleasure of life. Mr. Ford is especially afflicted in that no children remain from this long union to cheer and comfort his declining years. A sketch of her life will appear in an early number. Mrs. Ford was herself very much interested in horticulture, and especially in the culture of flowers. Sec'y.

IN MEMORIAM.

I am sad and very lonely,
As I think of other days;
Sorrow is my portion only,
While I try to sing her praise.
She was true as wife could be,
For she gave her life for me.

In this land of palms and roses,
Lay we now that form to rest;
While her dust in peace reposes,
All we love has joined the blest
In a clime where none grow old
Nor lay down their harps of gold.

But she loved those prairie flowers
And the notes of northern birds,
Lilies sweet in sylvan bowers
And the tramp of lowing herds.
There are dear ones who will weep
When they learn that she's asleep.

She and I so long have tended
Flowerlets fair from every clime.
Graces rare in her were blended,
That can ne'er be told in rhyme.
Now at three score years and ten,
Tearfully these lines I pen.

My dear wife, Abbie Guild Ford, expired from the effects of a paralytic stroke, received July 20, while going to visit the Misses Clark at Coronado. She brought me, quite sick, to Los Angeles, in November, 1885, and a year later to San Diego. Over forty years ago we were married at Sandusky, Ohio, and went to St. Paul, Minnesota, where I bought a claim in 1850, about half way to St. Anthony, there being no Minneapolis in those days.

Though an invalid from girlhood, she outlived many dear friends, and only two weeks before her death looked as young as at fifty, with only a tinge of gray hairs, and had not begun to use glasses. She was born in Pawlet, Vermont, December 31, 1824, my birthday being January 22, 1825.

L. M. FORD,
San Diego, California, August 4, 1896.

September Calendar.

J. S. HARRIS.

September is the month for agricultural fairs. Every farmer and horticulturist who possibly can should attend the state fair and see the full fruitage of the work of the state horticultural society, the best exhibition of fruit ever seen in the state. He should take his wife along and not forget to give his boys and girls the benefit of beautiful object lessons that will stimulate them to become better farmers and horticulturists.

He should also attend his own county fair with all of his family; holding a paid-up ticket by the "straight and narrow way," and help to make it a success by taking in something for exhibition.

Carry a memorandum book and pencil, and learn the correct names of the varieties of fruit, vegetables, etc., and set them down for future reference; interview the men who have the best exhibits and find out how they do it.

FRUITS.

Winter apples will keep better if gathered as soon as matured or tree-ripened and before severe frosts occur. They should be hand-picked from the trees and handled as carefully as you would handle eggs, and stored in a cool place. The fall fruit should be disposed of as fast as ripened. Nothing will be gained by waiting for better prices. That which is sold should be carefully sorted and made to be of one quality all through the package. Plenty should be dried for next spring's and summer's use, and to tide over a year of short crops; good dried fruit will always sell if not needed at home. The poorer grades should be ground up and converted into vinegar, and that which is worthless for other purposes should not be allowed to rot on the ground but be picked up and fed to stock.

Nameless fruit is much less valuable without a name than if it had one. Instead of inventing a name for it, take good specimens to the fair or to some competent person and find out the true name. Weeds in the orchard are a great nuisance and afford a harbor for vermin. Remove them before they scatter their seed.

In the small fruit garden, keep the strawberry beds clean from purslane and other weeds, and remove the old canes that have fruited and all surplus canes from the blackberry and raspberry patches, and clean out the weeds to give those remaining a chance to ripen and harden up for winter.

Grapes are now ripening, and birds often find them out and make sad havoc with them. Watch closely and if needs be use the hard remedy of powder and shot. Pick carefully when fully ripe, with long stems, and pack in baskets or shallow boxes for market.

Secretary's Corner.

THE SECRETARY AT THE FAIR.—On account of the official connection of the secretary with the horticultural exhibit at the state fair, he will be found there all through fair week, and during that period the office and library will be closed.

YELLOW CLOVER.—Mr. R. H. Pendergast, of Duluth, has sent me a specimen plant of a small kind of clover with a bright yellow blossom. Do any of our readers know anything about this? Mr. Pendergast found it growing on his lawn.

COL. J. H. STEVENS.—We are glad to announce the steady improvement in health of Col. Stevens. Few were aware of the severity of the attack which prostrated him some three months since. For several weeks he was confined to his bed, but a steady gain has at last brought him down stairs and out of doors, and we hope soon to see him about on the streets again. His active, temperate and wholesome life stand him in good stead now at the time of his need.

THREE SCORE AND TEN.—On August 17th last, our esteemed fellow worker, John S. Harris, passed the allotted span of life which terminates with the seventieth birthday, and he is now living on "borrowed time." With his temperate, cheerful and honest life, we have reason to believe his credit so good that he will be able to make a long loan at the outset and easily renew it as it matures. That he may be granted a long lease of days in which to prosecute the good work he has so much at heart is the earnest wish and prayer of his host of friends.

A CHANGE OF NAME SUGGESTED.—Prof. W. M. Hays, of the University Experiment Farm, suggests the advisability of changing the name of the "experiment stations" conducted under the auspices of this society to "trial stations," so as to avoid any possible confusion with the experiment stations now being conducted by the state experiment station as branches. There being now three of these substations in operation in which experiments are being conducted in horticulture as well as other branches of agriculture, it appears that such a change would be in the direction of clearness in nomenclature.

A FREESTONE PLUM.—We received from the Jewell Nursery Company, lately, specimens of a handsome reddish-yellow plum of large size for the season, $4\frac{1}{2}$ in. around, which at the proper stage of maturity is a full freestone, with fine flesh, of excellent quality and entirely free from astringency. We note that the stone is flat and of large circumference, so that the fruit is more nearly divided in half by it than in the case of any other native plum within our recollection. This, we take it, adds materially to its otherwise especial value for domestic purposes. It is also a fine dessert fruit. If the tree has as many good qualities as the fruit, it is well worth disseminating. No name accompanied the specimens.

HORTICULTURE IN THE NORTHWESTERN AGRICULTURIST.—The horticultural columns in this Minneapolis farmers' paper are now in the charge of Mr. E. J. Cutts. Mr. Cutts is a nurseryman of considerable experience residing at Howard Lake, Wright Co., and he is fortunate in being engaged in a business to which he is attached. He is a gentleman of culture and enterprise and will add an element of real value to this useful journal. Mr. Collins is to be congratulated in securing so competent a successor to Mr. Clarence Wedge, by whose efforts the horticultural department of this paper was given marked prominence. Mr. Cutts has been for some years an active and useful member of our organization.

KEROSENE EMULSION.—Hard soap, half pound; boiling water, one gallon; kerosene, two gallons.

Dissolve the soap in the water, add the kerosene, and churn with a pump for 5 to 10 minutes. Dilute four to twenty-five times before applying. Use strong emulsion for all scale insects; for such insects as plant lice, mealy bugs, red spider and thrips, weaker preparations will prove effective. Cabbage worms, currant worms and all insects which have soft bodies, can also be successfully treated. It is advisable to make the emulsion shortly before it is used.

The above is the latest formula for this useful preparation as issued by the Cornell Agricultural Experiment Station and can be relied upon.

OUR HORTICULTURAL LECTURER.—Prof. O. C. Gregg sends information of a change in the personnel of the lecturer on horticulture in the Farmers' Institute Corps, Mr. E. J. Cutts, of Howard Lake, Wright county, taking the place vacated by the resignation of Mr. Clarence Wedge. Speaking of Mr. Wedge's retirement, Mr. Gregg says: "I deeply regret the loss of Mr. Wedge from our work. His home conditions were such that he concluded he could not continue with us, so we reluctantly parted with him." In another note in this "Corner" reference is made to Mr. Cutts' training in and love for horticulture—and we believe he is well fitted to succeed also in this honorable and useful position. Mr. Wedge's mantle seems to have fallen upon him, and we expect he will wear it with credit to himself and benefit to the public.

NEW CREATIONS IN FRUITS AND FLOWERS.—The annual catalogue of Luther Burbank, of Santa Rosa, Cal., is one of great value to any one interested in the production of new varieties by the process of hybridization. According to this list his experiments are confined mainly to walnuts, quinces, plums, the small fruits and roses, though other species are not forgotten. His descriptions of new fruits include a raspberry earlier in ripening than the strawberry and one the fruit of which is three times the size of the Gregg; absolutely thornless raspberries, blackberries and dewberries; raspberry-strawberry hybrids, valuable, however, only as a curiosity, and many other objects of interest. A number of acres are being devoted to the work and hundreds of thousands of hybrids and cross-bred seedlings are being tested. It is claimed to be much the most extensive

enterprise of the kind in the world. The occupation is certainly a fascinating one as well as useful, and in these times of unlimited demand for something new may be a profitable one also.

"NORTHWESTERN POMOLOGY."—This is the title of a book published in 1894, by its author, C. W. Gurney, of Concord, Nebraska, a nurseryman of long experience. A marked and interesting feature of this work are the peculiarities of the writer which vein it throughout. Beginning with the propagation of stock in the nursery, he goes through the usual routine of subjects in similar works, concluding with a chapter on "Humbugs." Sufficiently in detail and in an attractive way he describes the various methods and processes in use in the culture of Northern fruits, giving in an easy and conversational style his views and experience on the subject.

Though a little foreign to the title, it contains a chapter on evergreens, born evidently of his experience with them. As a whole, it will be found an especially readable book and probably more than any other of its kind—except Prof. Green's "Amateur Fruit Growing," which was prepared expressly for this locality—of value to the Northwestern pomologist. The book is appropriately named. It is a duodecimo volume of 293 pages and for sale by the author.

PREMIUM LIST, ANNUAL MEETING, DEC. 1, 1896.—The following list of premiums on fruit to be exhibited at the next annual meeting, has been decided upon. As has already been announced in these columns, fruit designed for exhibition at that time can be sent to cold storage in Minneapolis, and will be cared for there without expense on the part of the exhibitor and at the proper time be delivered at the place of meeting. Apply to the secretary for tags to be used in making shipments.

APPLES AND CRABS.

	1st Prem.	2d Prem.
Collection.....3d prem. \$3.00	\$8.00	\$5.00
Each variety exhibited included in the fruit list of this society for 1896.....	1.00	.50
Each variety exhibited not included in above men- tioned list.....	.50	.25
Seedling apple, never before exhibited.....	3.00	2.00

PEACHES.

Exhibit, ad libitum.....	3.00	2.00
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GRAPES.

Collection.....	\$5.00	\$3.00
Each variety exhibited included in the fruit list of this society for 1896.....	1.00	.50
Each variety exhibited not included in above men- tioned list.....	.50	.25

PORTRAIT OF JNO. A. WARDER.—The portrait of this eminent horticulturist, who died in 1883, appearing as frontispiece to this number, was taken at Munich, in 1873, upon the occasion of his

visit to Europe in the interest of forestry. In a letter from his daughter, Anna A. Warder, of North Bend, Ohio, under date of Aug. 10, 1896, she speaks of this visit and of her father's great zeal in his chosen work:

"I think you have the Munich photograph taken in 1873, when my father went to Vienna as one of the U. S. Commissioners, and also of this state. He had for some years previously been much interested in the study and practice of forestry, and made this a subject of especial investigation while abroad, both in the various collections at the great Exposition and by trips into the forests himself, chiefly in Austria, the results of which you can find in his report to the United States government.

"We often felt that he was much in advance of the times. He studied medicine because in no other school could he get such a thorough knowledge of chemistry, which he felt was essential to successful farming. Again and again he was almost discouraged by the difficulty of arousing the state and nation to the importance of protecting and preserving the noble forests of our land, and often did he regret the short-sightedness which cleared vast acres without making any provision for future generations.

"Never very robust, he was in usual health, and with full vigor and mental powers in his 62nd year when he made the trip abroad, which he very much enjoyed, and from which he brought many lessons for the new school of forestry which he hoped would arise in this country. Though not altogether neglecting the kindred sciences of horticulture and agriculture, the chief labor of the next ten years were given to forestry."

The life and works of Dr. Warder are too well known and recorded to need any extended notice. It is a pleasure to be able to preserve in our reports a portrait of this noble man taken at a time when he was doing his best work for the world.

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Minneapolis Board of Park Commissioners, Annual Report, 1895.

Entomologist of State Experiment Station, Minnesota, 1895.

Western New York Horticultural Society, Annual Report, 1895.

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"	"	"	"	"	"	3,	"	7-12, 1892.
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B. Taylor

LATE OF FORESTVILLE, MINN.

THE MINNESOTA HORTICULTURIST.

VOL. 24.

OCTOBER, 1896.

NO. 10.

In Memoriam.

**BARNETT TAYLOR,
FORESTVILLE, MINN.**

Died August 9, 1896, aged 66 years.

Mr. Taylor was born in Greene county, Pa., May 12, 1830, and removed to Green county, Wis., in 1850, living at Juda, where he married and erected one of the first buildings in the town.

In 1857 he moved to Fillmore county, Minn., and settled in the village of Forestville, where he lived for ten years, then moving a mile from the village, where he built a beautiful home, and where, surrounded with books, fruit, bees and flowers, he passed the rest of his life.

Mr. Taylor was of strong character and has left his impression in the world, a great benefactor of Fillmore county and of the whole Northwest. He established the first nursery in Minnesota, which, while for years unprofitable to him, was of great value to the state. Eighteen years ago he sold his nursery to C. Morgan and has since devoted his time to bee culture. He was conceded to be authority on all matters pertaining thereto by all apiarists in the United States. He edited that department of the Farm, Stock and Home, besides contributing valued articles to all the bee journals of the land. He had a rare gift of inventive genius, which he exercised in the interest of his beloved craft, and many valuable improvements in connection with bee-keeping came from his hand.

Mr. Barnett Taylor was a good, plain every-day man, honest from the ground up, and thoroughly trusted by all who knew him. He would scorn to do a wrong, and had a pure heart and clean hands, admired by many and honored by all.

Three children, Mrs. C. Morgan, H. S. Taylor (married) and Jewell Taylor, who has always lived at home with his father, survive him.

Mr. Taylor had been a member of this society, as the record shows, since 1883. His face was a familiar one at its meetings, and his voice was often heard in words of counsel. While his attention was drawn principally to the keeping of bees, yet his interest in horticulture was a large one, exceeded, probably, by very few in our membership. We shall miss with sadness his kindly smile and earnest voice.

HORTICULTURE AT THE MINNESOTA STATE FAIR, 1896.

A. W. LATHAM, SEC'Y.

The fruit exhibit at the late fair was especially notable on account of its unusual as well as unexpected size. The preparations made, which were thought to be ample for all contingencies, proved to be altogether inadequate. All the available space on the World's Fair booth was called into use, and by close crowding a little room was gained in the half of the hall devoted to the county exhibits. To show all the fruit desired to be exhibited in competition, it was even necessary to resort to the unusual plan of removing that which had already been passed upon to make way for a second display. With all this crowding, of course, the general appearance of the exhibit was materially interfered with, as fruit never shows to good advantage when unduly crowded. A rough estimate shows some fifty-five exhibitors of apples, from "Uncle" Harris as the leading exhibitor, with in the neighborhood of 250 plates, down to some who had only a single plate of some choice variety. A number of the regulars thought their fruit too small for showing on account of the late, dry seasons and failed to appear, but the fruit in sight did not warrant the inference that any small or undersized fruit was being grown in Minnesota. For size, color and freedom from blemish, it stood very high. Probably, in all two thousand plates of apples were shown in the competitive exhibits. This does not include the very attractive and instructive array of Russian apples, one hundred and seventy-five varieties sent by Prof. J. L. Budd from the Iowa Agricultural College and so well arranged by his assistant, Mr. J. Sexton. It was a pleasure to make the acquaintance of Mr. Sexton, and many availed themselves of the opportunity to gain information about this interesting class of apples. A photograph was taken of this collection, which our readers will have an opportunity to see in a later number. In this connection we quote from a letter of Prof. Budd:

"Two-thirds of our varieties this year are not over one-third their usual size. The reasons are (1) our orchard is on a hard-pan sub-soil within five feet of the surface, (2) our trees bore heavily in 1895, and most of them were very heavily loaded this season.

"The drouth with the heavy crop of 1895 lowered the vitality of the trees.

"At our state fair grown in different sub-soils, we had over one hundred Russian varieties of unusual size but not from *our* orchard."

While the fruit was somewhat undersized, as Prof. Budd states, the exhibit was nevertheless a very handsome, attractive and valuable one, and we are much their debtor for the trouble taken in preparing it. At the close of the fair, through the courtesy of Mr. Sexton we were permitted to keep this fruit for further exhibition at our annual meeting in December. What was reserved for this purpose, together with considerable from our own exhibitors, has been placed in cold storage in Minneapolis.

An exhibit of about fifty varieties of apples was shown from our state experiment station at the University Farm, which is generally thought not to be very well located for apple culture.

The large number of seedling apples deserve special mention. About two hundred varieties were shown, including crabs and hybrids. Those to which awards were made for winter apples will be shown again at our coming winter meeting before the final award is made, and a further test will be made as to their comparative and positive merits.

The grape display was rather a light one, both as to number of plates and size and appearance of the bunch, but the judge, Mr. J. B. Rogers, an expert from New Jersey, commended them very highly. About three hundred plates were exhibited.

The show of plums was a representative one and included nearly every variety now propagated and a large number of valuable seedlings.

The only pears shown were by Mr. J. S. Harris.

A perusal of the accompanying premium list will be of interest to those who like to know who are growing our fruit and what part of the state is sending in the best specimens.

A larger proportion than usual of the exhibitors were sending their fruit to the fair for the first time, and it is very much to be hoped that they received sufficient encouragement and advantage in so doing to assure their becoming regular exhibitors.

Too many send their products and trust to others to arrange them. This should in every possible case be avoided. First, it is very unlikely that the exhibit can be as well arranged by another to secure satisfactory premiums, and, second, the principal benefit of the fair to fruit exhibitors come from actual contact and conference with the many prominent growers who are there.

As usual, some came who had made no entries and some were necessarily disappointed.

A little preliminary planning in preparation for the fair will prevent such disappointment, save much valuable time in putting up the display and increase the probabilities of success. More care in the selection of specimens and in arranging them on the tables will be found time well spent in the case of many exhibitors at our fairs. Then, more of the work of preparation should be done at home. To gather eight specimens of the variety desired to show, four for the collection and four for the single plate, wrap them in paper and throw haphazard with other varieties into a barrel and trust to luck to get them out and together again at the fair, is laying out a tedious job indeed. How much easier and quicker to secure beforehand a supply of paper bags and put into each bag four specimens of a kind, properly wrapped, packing the collective exhibit in a box by itself and the other exhibits by themselves. This method of preparation takes no longer than the very common "hit and miss" plan which is so vexatious and tedious.

The florists as usual occupied the space allotted to them and contributed willingly to the decoration of the fruit tables. We cannot spare the flowers, and a judicious mixture of the various products of our art gives pleasing results.

The fruit and flower exhibit as a whole emphasizes strongly the necessity of more elbow-room to keep pace with the development of

these industries. Let us hope the state fair management, who are recognizing the work of our department in an appreciative spirit may have the means as the result of two successive fairs to give us the larger accommodation we need.

PREMIUMS AWARDED AT THE MINNESOTA STATE FAIR, 1896.

FRUITS.

APPLES.

(Professional.)

Collection of apples.—J. S. Harris, LaCrescent, first, \$25.00. Wm. Somerville, Viola, second, \$20.00. Clarence Wedge, Albert Lea, third, \$15.00. M. Pearce, Chowen, fourth, \$10.00.

Collection of hybrids and Siberians.—J. S. Harris, first, \$5.00. Wm. Somerville, second, \$4.00.

(Amateur.)

Collection of apples.—Chas. Luedloff, Carver, first, \$15.00. Wm. Oxford, Freeburg, second, \$10.00. W. L. Parker, Farmington, third, \$8.00. Sidney Corp, Hammond, fourth, \$4.00. Ditus Day, fifth, \$2.00.

Collection of hybrids and Siberians.—Chas. Luedloff, first, \$5.00. Ditus Day, Farmington, second, \$4.00. J. A. Howard, Hammond, third, \$3.00. Lee B. Davenport, Excelsior, fourth, \$2.00. Sidney Corp, Hammond, fifth, \$1.00.

Single Plates of Apples.

Plate of largest apples.—Sidney Corp, first, \$1.50. Wm. Oxford, second, \$1.00. Wm. Somerville, third, 50c.

Plate of handsomest apples.—W. L. Parker, Farmington, first, \$1.50. J. A. Howard, second, \$1.00. Wm. Somerville, third, 50c.

Antinovka.—Clarence Wedge, first, \$1.50. W. L. Parker, second, \$1.00. J. S. Harris, third, .50.

Anisim.—J. S. Harris, first. W. L. Parker, second. Sidney Corp, third.

Autumn Streaked.—Sidney Corp, first. J. S. Harris, second. Wm. Oxford, third.

Blush Calville.—J. S. Harris, first. W. L. Parker, second.

Borovinka.—J. S. Harris, first. W. L. Parker, second. G. H. Smith, Long Lake, third.

Brett.—Sidney Corp, first. Wm. Somerville, second.

Charlamoff.—Clarence Wedge, first. W. L. Parker, second. Wm. Somerville, third.

Christmas.—J. S. Harris, first.

Cross.—Clarence Wedge, first. W. L. Parker, second.

Duchess of Oldenburg, largest.—J. A. Howard, first. Mrs. Isabella Barton, Excelsior, second. W. L. Parker, third.

Duchess of Oldenburg, handsomest.—Geo. Code, Edina Mills, first. E. B. Paul, Worthington, second. D. F. Akin, Farmington, third.

Elgin Beauty.—J. S. Harris, first. Sidney Corp, second. Clarence Wedge, third.

Fameuse.—W. L. Parker, first. Ditus Day, second. J. S. Harris, third.

Giant Swaar.—Sidney Corp, first. Wm. Somerville, second. J. S. Harris, third.

Good Peasant.—W. L. Parker, first. Wm. Somerville, second.

Haas.—W. S. Widmoyer, Dresbach, first. Clarence Wedge, second. J. S. Harris, third.

Hibernal, largest.—W. L. Taylor, Litchfield, first. M. Pearce, second. Sidney Corp, third.

Hibernal, handsomest.—Clarence Wedge, first. Wm. Oxford, second. J. S. Harris, third.

Longfield.—Clarence Wedge, first. Wm. Somerville, second. J. S. Harris, third.

McMahon White.—Sidney Corp, first. J. S. Harris, second. Wm. Somerville, third.

Malinda.—Clarence Wedge, first. Ditus Day, second. Wm. Somerville, third.

Okabena.—J. S. Harris, first. W. L. Parker, second. D. F. Akin, third.

Ostrekoff Glass.—J. S. Harris, first. W. L. Parker, second.

Patten's Greening.—Clarence Wedge, first. W. L. Parker, second. Chas. Luedloff, third.

Peach.—W. L. Parker, first. Ditus Day, second. Wm. Somerville, third.

Peerless.—Jacques Mueller, Morristown, first. C. F. Miller, Faribault, second. I. Waite, Dean, third.

Repka Malenka.—Wm. Somerville, first. Clarence Wedge, second.
 Rollin's Pippin.—M. Pearce, first. W. L. Parker, second. J. S. Harris, third.
 Rollin's Prolific.—W. S. Widmoyer, first. Wm. Somerville, second. J. S. Harris, third.
 Rollin's Russet.—Wm. Somerville, first.
 Talmon Sweet.—Ditus Day, first. J. S. Harris, second.
 Tetofsky.—Clarence Wedge, first. J. S. Harris, second. Ditus Day, third.
 Utter.—J. S. Harris, first. W. S. Widmoyer, second. G. H. Smith, third.
 Wealthy, largest.—Mrs. Isabella Barton, first. W. L. Parker, second. H. L. Crane, Excelsior, third.
 Wealthy, handsomest.—Ditus Day, first. J. A. Howard, second. Geo. Code, third.
 Wolf River.—Sidney Corp, first. W. L. Parker, second.
 Winter White Pigeon.—Sidney Corp, first. Wm. Somerville, second.
 Yellow Sweet.—Clarence Wedge, first. Wm. Somerville, second.

Siberians and Hybrids.

Largest hybrid.—O. F. Brand, Faribault, first, \$1.00. J. S. Harris, second, 75c. J. A. Howard, third, 50c.
 Briar's Sweet.—Wm. Oxford, first. Lee B. Davenport, second. Wm. Somerville, third.
 Dartt.—J. S. Harris, first.
 Early Strawberry.—W. L. Parker, first. J. A. Howard, second. Lee B. Davenport, third.
 Florence.—Ditus Day, first. W. L. Parker, second. Wm. Somerville, third.
 Gideon's No. 6.—Wm. Somerville, first.
 Hyslop.—Henry Busse, Minneapolis, first. J. A. Howard, second. O. F. Brand, third.
 Martha.—Clarence Wedge, first. W. L. Parker, second. Ditus Day, third.
 Minnesota.—J. A. Howard, first. W. L. Parker, second. Ditus Day, third.
 Powers.—W. L. Parker, first. Ditus Day, second. M. Pearce, third.
 Pride of Minneapolis.—A. H. Brackett, Long Lake, first. J. S. Harris, second.
 Sweet Russet.—Wm. Somerville, first. J. S. Harris, second. Ditus Day, third.
 Tonka.—D. T. Wheaton, Morris, first. Mrs. Isabella Barton, second. M. Pearce, third.
 Transcendent.—G. H. Smith, Long Lake, first. W. L. Parker, second. W. S. Widmoyer, Dresbach, third.
 Virginia.—D. F. Akin, Farmington, first. Lee B. Davenport, second. B. T. Hoyt, St. Paul, third.
 Whitney.—Mrs. Isabella Barton, first. W. L. Parker, second. J. S. Harris, third.

Seedling Apples.

Collection.—J. S. Harris, first, \$8.00. D. F. Akin, second, \$6.00. Ditus Day, third, \$4.00.
 Collection Siberians and hybrids.—John R. Cummins, Washburn, first, \$6.00. H. M. Lyman, Excelsior, second, \$4.00. Ditus Day, third, \$2.00.
 Fall variety.—H. M. Lyman, first, \$6.00. O. F. Brand, second, \$4.00. D. F. Akin, third, \$2.00.
 Winter variety.—J. S. Harris, first, \$15.00. W. L. Parker, second, \$8.00. H. M. Lyman, third, \$4.00. Dewain Cook, commended.

GRAPES.

Collection.—Lee B. Davenport, Excelsior, first, \$20.00. Gus Johnson, Excelsior, second, \$15.00. Isabella Barton, Excelsior, third, \$10.00. M. M. Frisselle, Eureka, fourth, \$8.00. C. W. Sampson, Eureka, fifth, \$6.00.

Single Plates.

Agawam (Roger's No. 15).—Gus Johnson, first, \$1.50.
 Aminia (Roger's No. 39).—Lee B. Davenport, first, \$1.50.
 Brighton.—Gus Johnson, first, \$1.50. H. L. Crane, second, \$1.00. Lee B. Davenport, third, 50c.
 Concord.—H. L. Crane, first. C. W. Sampson, second. Lee B. Davenport, third.
 Cottage.—Lee B. Davenport, first.

Delaware.—Lee B. Davenport, first. Mrs. Isabella Barton, second. C. W. Sampson, third.

Duchess.—Lee B. Davenport, first.

Early Victor.—Mrs. Isabella Barton, first.

Eldorado.—Mrs. Isabella Barton, first.

Empire State.—Mrs. Isabella Barton, first. Lee B. Davenport, second.

Herbert (Roger's No. 44).—Lee B. Davenport, first.

Iona.—Lee B. Davenport, first. C. W. Sampson, second.

Lindley (Roger's No. 9).—Lee B. Davenport, first. M. M. Frisselle, second.

Lady.—Lee B. Davenport, first. C. W. Sampson, second.

Massasoit (Roger's No. 3).—Lee B. Davenport, first.

Moore's Early.—Lee B. Davenport, first. Mrs. Isabella Barton, second. H. L. Crane, third.

Niagara.—Mrs. Isabella Barton, first.

Pocklington.—Mrs. Isabella Barton, second. L. B. Davenport, third.

Poughkeepsie Red.—Mrs. Isabella Barton, first.

Telegraph.—L. B. Davenport, first.

Wilder (Roger's No. 4).—L. B. Davenport, first.

Worden.—Gus Johnson, first. H. L. Crane, second. L. B. Davenport, third.

Wyoming Red.—Mrs. Isabella Barton, first. L. B. Davenport, second. C. W. Sampson, third.

PLUMS.

Collection.—Chas. Luedloff, Carver, first, \$5.00. O. M. Lord, Minnesota City, second, \$4.00. Dewain Cook, third, \$3.00. Aug. Wittman, Merriam Park, fourth, \$1.00.

Cheney.—A. H. Brackett, first, \$1.00. W. L. Parker, second, 75c. Martin Penning, Sleepy Eye, third, 50c.

Desota.—Clarence Wedge, first. Chas. Luedloff, second. W. L. Parker, third.

Forest Garden.—Chas. Luedloff, first. W. F. Coffin, Hamline, second. L. B. Davenport, third.

New Ulm.—O. M. Lord, first. Chas. Luedloff, second. Dewain Cook, third.

Ocheeda.—Chas. Luedloff, first. A. H. Brackett, second. O. M. Lord, third.

Rockford.—Dewain Cook, first. W. L. Parker, second.

Rollingstone.—Dewain Cook, first. Chas. Luedloff, second. A. H. Brackett, third.

Stoddard.—O. M. Lord, first. W. L. Parker, second. Martin Penning, third.

Surprise.—Martin Penning, first.

Weaver.—Martin Penning, first. Chas. Luedloff, second. W. L. Parker, third.

Wolf.—O. M. Lord, first. Dewain Cook, second. Chas. Luedloff, third.

Wyant.—Chas. Luedloff, first. O. M. Lord, second. Dewain Cook, third.

New seedling.—W. S. Widmoyer, first. Dewain Cook, second. Sacred Heart Nursery, third.

PEARS.

J. S. Harris, first, \$3.00.

FRESH BLACKBERRIES.

Ancient Briton.—H. L. Crane, first, \$1.00.

FLOWERS.

(For Professional Growers.)

Collection of greenhouse and hothouse plants.—Mendenhall Greenhouses, Minneapolis, first, \$30.00. Jacob Hartmann, Minneapolis, second, \$25.00. E. Nagel & Co., Minneapolis, third, \$20.00. John Vasatka, Minneapolis, \$10.00.

Collection of foliage and decorative plants.—Mendenhall Greenhouses, first, \$15.00. E. Nagel & Co., second, \$10.00. John Vasatka, third, \$5.00.

Collection of climbing vines, five varieties.—Jacob Hartmann, first, \$2.00. E. Nagel & Co., second, \$1.00. John Vasatka, third, 50c.

Collection of five hanging baskets, one of a kind.—John Vasatka, first, \$2.00.

Collection of coleus, six or more varieties.—John Vasatka, first, \$2.00. Jacob Hartmann, second, \$1.00. E. Nagel & Co., third, 50c.

Collection of tuberous-rooted begonias.—E. Nagel & Co., first, \$2.00. John Vasatka, second, \$1.00.

Single specimen palm.—Mendenhall Greenhouses, first, \$3.00. E. Nagel & Co., second, \$2.00. John Vasatka, third, \$1.00.

Tuberous-rooted begonias, single.—E. Nagel & Co., first, \$2.00. John Vasatka, second, \$1.00.

Tuberous-rooted begonias, double.—E. Nagel & Co., first, \$2.00.

Geraniums in bloom, ten varieties.—John Vasatka, first, \$4.00. E. Nagel & Co., second, \$2.00. Jacob Hartmann, third, \$1.00.

Collection of tri-colored, variegated geraniums.—Jacob Hartmann, first, \$2.00. John Vasatka, second, \$1.00.

Vases filled with plants, at the fountain in Horticultural Hall.—Jacob Hartmann, first, \$4.00. John Vasatka, second, \$3.00. E. Nagel & Co., third, \$2.00.

CUT FLOWERS.

Collection of cut flowers in design.—Mendenhall Greenhouses, first, \$10.00. E. Nagel & Co., second, \$5.00. John Vasatka, third, \$3.00.

Asters, assorted colors, not less than ten kinds.—Jacob Hartmann, first, \$3.00. E. Nagel & Co., second, \$2.00. John Vasatka, third, \$1.00.

Gladioli, twelve distinct colors.—John Vasatka, first, \$3.00. E. Nagel & Co., second, \$2.00.

Carnations, ten varieties.—Jacob Hartmann, first, \$3.00. E. Nagel & Co., second, \$2.00. John Vasatka, third, \$1.00.

Roses, six varieties.—Mendenhall Greenhouses, first, \$3.00. E. Nagel & Co., second, \$2.00. John Vasatka, third, \$1.00.

Pansies.—Jacob Hartmann, first, \$3.00. John Vasatka, second, \$2.00.

Petunias.—Jacob Hartmann, first, \$3.00. E. Nagel & Co., second, \$2.00. John Vasatka, third, \$1.00.

BASKETS AND BOUQUETS.

Twelve-inch basket of flowers.—Mendenhall Greenhouses, first \$5.00. E. Nagel & Co., second, \$3.00. Jacob Hartmann, third, \$2.00. John Vasatka, commended.

Pyramid bouquet.—E. Nagel & Co., first, \$3.00. Jacob Hartmann, second, \$2.00. John Vasatka, third, \$1.00.

Hand bouquet.—E. Nagel & Co., first, \$3.00. Jacob Hartmann, second, \$2.00. John Vasatka, third, \$1.00.

Bridal bouquet, white flowers.—E. Nagel & Co., first, \$3.00. John Vasatka, third, \$1.00.

(For Non-Professional Growers.)

Collection of house plants in pots.—M. M. Flagg, St. Anthony Park, first, \$5.00. Mrs. Wm. Lyons, Minneapolis, second, \$3.00.

Collection of coxcomb.—Mrs. Wm. Lyons, second, \$1.00.

Collection of geraniums in bloom.—Mrs. Wm. Lyons, first, \$3.00.

Collection of foliage plants, five varieties.—Mrs. Wm. Lyons, first, \$3.00.

Hanging baskets, a pair.—Mrs. Wm. Lyons, first, \$2.00.

Collection of climbing vines.—Mrs. Wm. Lyons, first, \$2.00.

Collection of annual cut flowers.—Miss Emma V. White, Minneapolis, first, \$3.00. M. C. Axtell, Minneapolis, second, \$2.00. Mrs. Wm. Lyons, third, \$1.00.

DECKER'S LATE SEEDLING PLUM.

This variety received the first prize as a seedling at the Minnesota State Fair, 1896. It was exhibited by W. S. Widmoyer, of Dresbach. About twenty years ago Mr. Martin Decker, of Dresbach, Minn., bought a "German prune" tree of an agent, but it turned out to be a large, blue plum. This tree lived a few years and was killed by stock or something else. In the meantime, a son, Mr. H. C. Decker, had planted some of the pits of these plums, and the plums shown at the fair were the result. I think it will be one of the best, if not the best, late shipping plum we have. The tree is perfectly hardy and healthy so far, and a very strong grower. W.

AGRICULTURAL HALL, STATE FAIR, 1896.

J. B. ROGERS, NEWARK, N. J.

VEGETABLES.

Four days spent at the state fair of Minnesota, most of the time in Agricultural Hall, gave me an opportunity to note some of the educational features of the exhibits displayed therein.

From a horticultural standpoint, I consider the exhibit by Mr. Mackintosh of watermelons and muskmelons entitled to first place of all the products shown in the hall. Minnesota can grow muskmelons, which general term includes cantepoles, nutmegs, citron and muskmelons, of fine quality; that is of the very best flavor, thick flesh and large size. (Yet, right here a word of caution; too many exhibitors think size of too much consequence.) Melons can be judged as to purity of variety and quality by their outward appearance; but from an inspection of those offered for sale in Minneapolis, melon growers cultivate, as a rule, melons in name only, and of a quality unfit for eating and intended only for the manure heap. Pardon this expression, as I use it only to enforce the fact that most of the melons offered for sale are not worthy of being grown. I have heard it said the West could not grow a good melon. I do not wonder this idea prevails; yet you can grow the finest of melons, though to do so more care must be exercised in the strain of seed planted. Mr. Mackintosh's exhibit proves that quality can be had in Minnesota grown melons. Itasca county had the best selected muskmelons as to quality of all of the eight counties making exhibits.

COUNTY EXHIBITS.

The eight counties making exhibits established the fact that Minnesota can grow a great variety of cereals, native grasses, tame grasses, clovers, rape, potatoes, stock vegetables and peas, culinary vegetables and fruits. What can be grown is now known. The schedule of points for judging drew sharp distinctions between grain crops, forage crops, farm crops, farmer's garden crops, market crops and miscellaneous crops.

Illustrations: Cabbage, under eight pounds per head, garden; over eight pounds, kraut or stock. Tomatoes: Traverse county, scored the largest of any, 50 points out of a possible 100; Mille Lacs, only 25 out of 100. The excuse given for this low scale was distance in transportation to reach the fair. Improved varieties of tomatoes can be transported 1,000 miles, taking many days to reach their destination. The true reason of low per centage in scaling was that all improved varieties of tomatoes should be picked when they first begin to color and be ripened and colored up in the dark. The cracking of tomatoes around the stem end is caused by dew or rain falling on the fruit after coloring begins. The great loss in tomato culture is from this one point, usually amounting to one-half and often three-quarters of the crop. Old varieties had to ripen on the vine, new varieties never. Tomatoes rotting on the vine are, in many instances, owing to variety.

Exhibit of Muskmelons and Watermelons, made by Wm. Mackintosh, of Langdon, at the Minnesota State Fair, 1896.

In the premium list of the state fair was given a scale of points for the guidance of judges, and these, although clear and decisive to any one accustomed to selecting county exhibits, yet would be confusing to beginners. The distinctions between stock and culinary vegetables, while well defined and simple when once understood, in the several county exhibits became merged one in the other, and the judges had to assume the duties of the exhibitors, and separate and classify them. This can never educate the exhibitors, hence, might it not be policy to have separate classes for stock vegetables and culinary vegetables? Beets, carrots, parsnips, turnips, cabbage, and kohlrabi at a certain stage of growth and maturity, cease to be of the culinary class and become stock vegetables. In many instances the beets, carrots and parsnips exhibited had the long tap root, which grows deep in the ground, separated into three or more roots, and this in many cases so near the surface of the ground as to destroy the value of such vegetables for family or market purposes. In the East, in the older settled portion of the country, such defects in growth are caused by planting the seed on ground enriched by freshly made manure in which there is a large proportion of straw. Whenever the descending root comes in contact with decomposing vegetable matter in the soil, such as coarse manure, it has a tendency to cause a branching of the root; hence, the rule, never plant such vegetables as beets, carrots, turnips, parsnips and radishes intended for table or market purposes on soil freshly manured with long manure or with too much decomposing vegetable matter in the soil. For stock feeding no evil results from such methods.

THE FRUIT EXHIBIT.

The fruit exhibit at the last Minnesota state fair showed that Minnesota can produce apples as to color, size and shape worthy of the high name she bears for fruits. The eye beholds an array of as high colors with as pure hues as any exhibit I ever saw. I made a critical examination of many of the varieties and of seedlings. Within the last few years a great improvement in seedling apples can be seen, especially in quality. Among the seedlings exhibited was one of the Wealthy type exhibited by T. J. Lightly, of Oakland township, Freeborn county. The tree was one of a number sold to Mr. Lightly by Peter Gideon many years ago. The apple as exhibited was almost identical with the Wealthy, as highly colored, skin thicker and, evidently, a later keeper. While too much reliance can be placed upon one year's exhibition and testing, yet this apple would seem to fill out a vacant spot in Minnesota apples of the Wealthy type, as it would evidently be a good shipper and in good eating order after the Wealthy had gone. Many other seedlings were tested, a few of which were of good quality, and of which the reports of the judge can be had.

The exhibition of Russian apples from the Iowa Experiment Station was an interesting one. To the growers of Russian apples it was a treat, yet it did not surpass the apples grown by Minnesota exhibitors.

Some of the plates of apples exhibited would tend to show that the growers had not exercised sufficient care in the selection of the fruit, and in some cases the grower might have taken practical lessons from other plates exhibited.

In plums the exhibit showed many varieties of improved quality, proving that this section will soon have well defined varieties of plums of a quality superior to those now in cultivation. Decker's seedlings and seedlings of the Miner, grown by W. S. Widmoyer, of the North Star Fruit Farms, Dresbach, were of the first quality and worthy of trial. Other seedlings were shown of fair to good quality, and from them much is to be hoped.

The exhibit of grapes was not up to the standard which I had seen here before. This is not to be wondered at, as over the entire country this season grapes are lacking in size and in flavor, and it is considered a poor season for this fruit. The exhibition as a whole was a creditable one. The Moore's Early, of which five plates were shown was, taken as a whole, the finest I have ever seen. The plates on the table were too crowded and marred the effect of the exhibit. In fact, there was no room for the judges to place their plates, and very many exhibits could not be placed on the tables at all.

The fruit interests of Minnesota have now arrived at a point, where, in justice to the growers, a separate hall should be erected for the exhibits of fruits and flowers. This hall should have all the modern appliances, and I believe that many more exhibitors would come forward. There were sufficient fruits and flowers this year to have filled the entire agricultural hall, if shown to the best advantage. The arrangements of the present hall are such that the choicest plants, fruits and flowers cannot be shown four or five days in succession without great loss to the exhibitors.

CUT WORMS—HOW TO KILL THEM.—Cutworms are the larvae of owlet moths which lay their eggs in weedy or grassy places. No eggs will be laid on ground in the summer. Burning weedy or grassy places will kill many of the eggs and young cutworms. Burning the stubble rapidly just before plowing has proved an effective remedy against cutworms.

For gardens, orchards and small fields the best plan is to poison the cutworms with bran mash bait colored with paris green. Mix one part by weight of paris green or London purple, with fifty parts of dry wheat bran till all is of a greenish color. Moisten the mash, or mix with watery molasses, so it may be formed into balls. Drop tablespoonfuls of the bran mash or the poisoned bran balls, in rows three feet apart each way over the infested patch. Cover the bran with a little soil. The cutworms will eat the poison and crawl away to die.

If the poisoned bait be put out when the seed is sown or dropped in the holes when transplanting, the cutworms will be killed before they can damage the crop. Keep cultivated ground free from weeds and grass so that there will be no cutworms to live through the winter.

EVERGREENS.

A. NORBY, MADISON, S. D.

Nowhere in this broad land is shelter more needed than here on this vast plain, subject to fierce winds from all points of the compass. For windbreaks, no trees are so well adapted as the pines, cedars and spruces. Still these are yet very scarce in South Dakota. Failures in raising them have been numerous, and only a small per cent of the number planted are now alive. The reason lies in the selection of varieties—natives of moist climates and localities with twice or three times the precipitation we have—and also the lack of proper care. Evergreens, as a rule, are planted in front of the dwellings, where the ground is in grass and must of course remain so; then mulched and sometimes watered. The mulch prevents all except very heavy rains from reaching down to where it would do the tree any good. A little water, however often applied, only wets the surface, which in return generally turns hard and dries out all the faster. Few have any idea how much water it takes to soak the dry soil down to any depth. The sub-soil under grass covered grounds unless soaked with water is as dry as ashes for months during the dry periods, consequently few trees of any description survive.

To make a success of raising evergreens the land must be deeply plowed or spaded, well subdued, and after the trees are planted thoroughly cultivated every season up to harvest time, and the plants if small protected during the winter with any kind of rubbish to hold the snow.

In the fall of 1894 (the driest season on record), the writer examined the sub-soil to a considerable depth on the highest and apparently driest hill in the neighborhood, and found it surprisingly moist nearly to the surface. On this hill stand today about one hundred and fifty red cedars, six to eight feet high, every one a picture of health and vigor, all the result of cultivation only.

VARIETIES.

Scotch pine is one of the fastest growers while young, but gives little promise of becoming a long lived tree in this section; it leans over to the north like the white willow, and the last winter proved fatal to a large per cent of trees one to three feet high.

The white pine is a much prettier tree, and when it thrives I don't see why anybody wants to plant the Scotch, but here the hard winds and dry cold winters are too much for it. South Dakota is evidently not in the white pine belt.

The red pine (*Pinus resinosa*) proved a disappointment, although generally described as very hardy. Seventy-five per cent of two to three feet trees, well established, were killed by the cold last winter—by the cold and not by drouth, as some seem bound to have it. Small spruces and firs a few inches high growing by their side under the same conditions nearly all came out alive. The last winter proved an exceptionally trying one on evergreens, but the red pine always shows more or less brown leaves and weakness in the spring and looks red indeed.

Black Hills, or yellow, pine (*Pinus ponderosa*). This is the only pine native of South Dakota and northwest Nebraska. It is the most

promising of all the pines for the dry plains. When young it is no hardier than the Scotch if grown on rich, well tilled ground, but it will live and grow under the most adverse conditions right in the sod or among the weeds and wave defiance to drouth and storms for ages. The *pinus ponderosa* is a sturdy, robust grower, with very long, light green leaves; it is a little difficult to transplant and needs winter protection while small.

The dwarf mountain pine is very hardy and is worthy of planting for ornament.

Norway spruce. Our dry air and bright sunshine are not at all suited to the wants of this popular tree.

The white spruce (*Abies alba*) of the East, is better, but being a very shallow rooted tree and inclined to lean to the north, it will likely not live to any great age; in dry seasons it makes less growth than the red cedar. The Black Hills spruce transplanted from the hills is much better in every way and is well worthy of planting.

Colorado blue spruce (*Picea pungens*). This most beautiful of all evergreens stands well with us; it is the hardiest of all the spruces, a thrifty grower, and stands the hard winds remarkably well; it has a deeper root system than the white spruce, keeps its green color well through the winter, and in early summer the best specimens unfold their silvery robes here on our windy sun-scorched plains as well as in its native home in the deep gorges high up among the clouds. Owing to its habit of starting late in the spring, it generally escapes late spring frosts, which have done considerable damage to other spruces.

Douglas spruce. This is the great timber tree of the North Pacific coast. It is also found on this slope of the Rocky Mountains. Here in South Dakota, it has not come up to expectations. Specimens on my grounds sent from Colorado ten years ago have made the smallest growth of all my evergreens. The foliage is always more or less hurt by the sun's action in February and March.

The *abies concolor*, from Colorado, seems better adapted to prairie planting, but our experience with this variety is limited. Like the blue and Black Hills spruces, trees raised from wild plants grown on this side of the mountains make hardier and finer trees than Eastern grown nursery plants.

The balsam fir stands well and looks well till about fifteen or twenty years old, when it begins to fail and look ragged.

The red cedar is one of our trees. It grows in places along the Sioux and Missouri rivers and in the Black Hills. It is the most adaptive of all evergreens as to soil and climate; it is a tree of inestimable value for the dry plains, and the best evergreen hedge plant for the Northwest. Here it grows faster than any of the spruces, shows no effect from winds, hot or cold, and makes a most perfect and lasting shelter. While this tree stands drouth to a remarkable degree, there are places in this state which were evidently too dry for it the last seasons where left to grow in the sod. Like the *ponderosa*, it needs winter protection when small.

Arbor vitae is a failure.

GOLDEN, OR FIVE-BANDED, BEE.

W. H. BRIGHT, MAZEPPA.

This is a subject that I feel somewhat timid about taking up. Being a breeder of this class of bees, and they being condemned by some of our fraternity, it makes me feel as though I was on forbidden ground; but what is said will be from a practical and not from a theoretical standpoint.

It has been fairly demonstrated by good authority that any undesirable trait may be bred out of any race of bees, such as a desire to swarm, etc. It may take years of careful breeding to bring this about, but it has been done to a certain extent. This being the case, the breeder could breed to any trait desired. We, as bee-keepers, may differ in what we consider to be the most desirable points; nor do I wonder at this, for so much depends on circumstances, such as locality and the purpose for which they are to be used. Right here I want to give a list of the qualities most to be desired for this locality and for general purposes: Prolificness, 20 per cent.; size, 10 per cent.; hardiness, 10 per cent.; gentleness, 15 per cent.; color, 15 per cent.; longevity, 10 per cent.; industry, 20 per cent.

You may think that I have placed too many points on color, but I find, by experience, that color is one of the essential points, and it should stand next to industry and prolificness in obtaining a perfect race of bees. That is where you can obtain it without losing sight of other valuable qualities. Let a manufacturer of sections claim that it does not make any particular difference about the snow-whiteness of the section he is making, how long will he be able to sell them? Does the color add anything to the sweetness of the honey built in those sections? But it does have something to do with the sale of the honey. As American people all desire things that are pleasing to the eye as well as to the taste, let us not be too quick to condemn something that we all admire. Can this extra yellow color be obtained without breeding Italian with Cyprian or Cyrian bees? As I have already stated, we can breed to any trait we desire.

By careful selection of the finest marked bees from pure Italians, we can produce these golden bees in a few seasons. G. M. Doolittle states that we can obtain this golden color without crossing the Italian with any other breed. These bees have given entire satisfaction with me and my customers; I have not had one word of complaint from any one. They seem to enter the super quicker, and swarming is not indulged in quite as much as with common Italians. They are easily handled and cling to the combs while working with them. They are good to defend their homes. In fact, they seem to have as many or more of the desirable qualities than the common Italians, and I must say that they afford me much pleasure as well as profit, as I have to pass by the yard going to and from my work, and I always stop and feast my eyes on those golden beauties.

COTEAU FARM, THE HOME OF MR. O. C. GREGG.**A. W. LATHAM, SEC'Y.**

Connected with the State Experiment Station there are three substations, destined to perform in their respective localities a similar service to the public that the central station is working out at St. Anthony Park. The three, in location and surroundings, differ very widely. The one at Crookston, is located on the dead level of the Red River Valley in its deep and rich alluvial soil. Another at Grand Rapids, a little to the south and about 150 miles to the east, is in the pine regions near the head-waters of the Mississippi. This station was spoken of at some length in a late number of the magazine. The third is found at Lynd, a station on the Willmar and Sioux Falls division of the Great Northern railroad, some forty miles south of Granite Falls, the point where that railroad crosses the Minnesota river, and about thirty miles east of South Dakota.

The location of this station is peculiar in that it stands upon the eastern border of what is called the coteau, or hill, district, which, beginning in this locality, trends westward into South Dakota at an elevation of several hundred feet above the surrounding country. At some points these hills break out above the general level and are unfit for tillage, but at the place of which we are speaking the surface is like that of any other undulating prairie.

Four miles from Lynd station then, across the clear and swift running little Redwood river, and up an easy grade to an elevation of nearly two hundred feet, is located the Coteau Farm, the home of Mr. O. C. Gregg, so well known to the farmers of our state as the genial superintendent of the farmer's institutes. This is the original homestead of Mr. Gregg, upon which he built his claim shanty a quarter of a century ago, and where he is now exemplifying in a practical way the truths which are taught from the institute platforms, and where it is evidently his laudable ambition to cover the entire field in his investigations.

Our readers will be more especially interested in what Mr. Gregg is doing in the direction of horticulture, and we are especially glad, of course, that in this practical way he is taking hold of the art we love. Mr. Gregg has always been a friend of horticulture, but we are assured now that he will become as one of us, as the progress of his experiments will surely lead him, as it has us, to the second stage of the enthusiast.

Aside from the windbreaks, which were already upon the farm, the horticultural experiments are at present in the primitive stage. The first plantings of trial stock were made two years ago last spring, and include, in a tract of three or four acres, a great variety of the hardier forest, shade and ornamental trees, some of the small fruits, and later a few apple trees. This stock has evidently had the best of care—and, by the way, in the direction of thorough culture Mr. Gregg is already an enthusiast, and judging by the appearance of the whole place and the great variety of improved implements adapted to do thorough work, it is evident that he knows what he is talking about when he speaks of "thorough cultivation."

The plans for fruit experiment provide for the planting another spring of a large experiment orchard on ground which is being prepared for it and which is suitably sheltered, where all the varieties likely to succeed in that locality will be tested under proper conditions. Grape vines and other fruits as well are also to receive their due share of attention and are to be given full opportunity.

The very delicate problem of providing the right quantity of wind-break and at the same time leaving an orchard sufficiently exposed to furnish the necessary air drainage will be carefully studied on this farm, and some definite conclusions may be arrived at which will be of value to all Northwestern prairie farmers. The Coteau Farm stands on a wind-swept prairie elevation, and the rustling of the leaves in the willow shelter bordering the residence, with a thirty mile breeze, on the frosty night of September eighteenth, gave the writer some idea of the difficulties with which the prairie fruit grower must contend. The everlasting grind of the drying prairie winds easily reduces the vitality of fruit trees; at the same time, they must have the air to thrive. Just how little or how much of both, we hope Mr. Gregg may be able to speak understandingly of when farther along in his experiments.

This station, through the liberality of its owner, is under the management of the state station, and of course its horticultural section has the benefit of the supervision of Prof. S. B. Green. We shall hear from him occasionally, and we hope also from Mr. Gregg as well, as to the progress of this valuable experimental work. The results there will be an important guide, especially to that portion of the state located on the hills; but problems of wind protection and air drainage, as well as the selection of varieties, are very much the same in all the prairie portions of our state, varying somewhat with the varying characteristics of different locations.

Mrs. Gregg in her sphere is not to be ignored. The long array, in infinite variety, of brilliant annual flowers, stretching down and along the two sides of the family garden, bear eloquent testimony to her love for these silent messengers of the infinite. The shelter of double windbreaks of willows, planted by Mr. Gregg in his pioneer days and duly matured and encouraged in later times by heavy mulchings of straw, furnishes a quiet nook on this restless hill for Mrs. Gregg and her beautiful flowers. We hope the professor of horticulture may extend his experiments in the direction of the beautiful and the ornamental under Mrs. Gregg's care, as well as provide for what are often, though mistakenly, thought to be the more necessary products of his art. The Coteau Farm is evidently to be an object lesson in brightening and gracing the prairie home, as well as in supplying its table and cellar with the fruit of the garden and orchard.

NOMENCLATURE AND CATALOGUE.

J. S. HARRIS, LA CRESCENT.

Your committee find that some good is resulting from the publication of annual reports on "Nomenclature and Catalogue." There were not nearly as many varieties wrongly named at the fairs of 1895 as there had been at the fairs of previous years; both planters and exhibitors are taking more interest in pointing out the correct names of the fruits they grow and take considerable pains to compare their fruit with that of other exhibitors and growers. But there is still need of maintaining such a committee and will be as long as any of our tree planters and fruit growers are not well posted in varieties and trees continue to be sold by incompetent agents or propagated by careless nurserymen; and, as new varieties will continually be brought forward, the naming and describing of them will be a necessity. We are still unable to get some of the new Russian varieties out from the fog that overshadows them and get them under their correct names, largely from the trees having been procured by numbers, which are much sooner forgotten than even the to us outlandish and jaw-breaking names by which they are known in their own country.

The past year was not favorable for describing and adding many of the new Russians to the list in our catalogue. At the fairs more of the Walbridge and Utter were shown under wrong names or as unknown than any other varieties. I attribute this in the case of the Walbridge to the fact that about sixteen years since it was enjoying a boom and was being propagated extensively by that class of nurserymen who are bound to sell anyway, and their agents have unloaded their trees upon unsuspecting farmers under names that take best.

We gave in 1895 some installments of the report in the magazines of September, October and November, believing it would be more seasonable, besides making the annual report less lengthy. To get them on record for future reference, we here present a few descriptions and would have been glad to give more had we data to go by so that they might not hereafter get confused. We will here suggest that it would greatly facilitate the work of your committee if every person who furnishes us samples for examination or places seedlings on exhibition at fairs would label them with some name, number or letter with their own name and post-office address, and let them only be known by that name, number or letter until they are rightly disposed of by the action of this society or properly named and recorded.

Lyman's Prolific.—Siberian hybrid; size large (2 to 3); form roundish, slightly conic; color greenish-yellow ground, striped and splashed with red; stem long and slender in a medium narrow cavity; calyx closed; basin medium, much wrinkled; flesh yellow, nearly fine; flavor mild acid, slightly acrid; core small, closed; quality fair, best for cooking; tree, hardy and very heavy fruiter. Originated by H. M. Lyman, Excelsior, Minn.

October.—Supposed Siberian hybrid; size very large, 4 (by apple scale); form round, slightly angular; color greenish-yellow, mostly covered with marblings and stripes of red; stem long in a medium cavity; calyx partly open in a small, shallow, wrinkled basin; flesh nearly white; flavor pleasant acid, good; season, October or earlier. Originated by Peter M. Gideon, Excelsior, Minn.

Red Cloud.—Size 5 (by apple scale), or full medium; form roundish; color clouded a light and dark red over a yellow ground; stem long and slender; cavity rather broad, medium deep; calyx open in a medium wrinkled basin; core medium, half open; flesh fine-grained, white, often stained with red, tender and juicy; flavor aromatic sub-acid; quality very good. Origin, seedling by Otto Wasserzieher, Bay Lake, Minn.

Bay Lake Sweet.—Size 5; form round conic; color yellow, marbled and striped with red on sun side and showing numerous small gray dots; stem very long and slender, set in a regular, rather broad, medium deep cavity; calyx closed in a medium, nearly smooth basin; flesh white, fine-grained, firm; flavor sweet; season, winter. Origin, same as Red Cloud.

Prolific Seedling.—Size 2, or very large if it is a Siberian hybrid; form round oval; color pale greenish-yellow and blush; stem medium in a narrow angular cavity; calyx closed in a smallish, corrugated basin; flesh yellowish-white, firm, a little tough; flavor a pleasant acid; season, winter. Origin, Bay Lake, Minn.

Blush Seedling.—Size 3; form cylindrical, slightly conic; color a greenish-yellow with a brownish blush and striped cheek; stem medium long; cavity broad and slightly angular; calyx small, closed basin, broad, shallow and much wrinkled; flesh yellowish, nearly fine, hard, juicy; mild acid flavor; core rather large; season, winter. Origin, Bay Lake, Minn.

Three of the Miller seedlings were exhibited under names and they can be hereafter recognized as follows:

Miller's Prolific.—Size 4, or about medium; form roundish-oblique; color greenish-yellow with light stripes and splashes of red on sun side; stem rather long in a broad, greenish cavity; calyx, closed basin, angular, medium deep; flesh yellowish-white, tender, juicy; flavor acid, slightly sub-acid; season, October. Origin, Rice Co., by Geo. Miller.

Miller's Greening.—Size 5; form roundish-ovate, angular; color greenish-yellow with blush cheek and thickly specked with small gray dots on sun side; stem short and stout; cavity medium deep, russeted; calyx large, half open; basin narrow, rather abrupt, medium deep and ribbed; flesh yellow, nearly fine; flavor sub-acid, good; season, early winter. Origin, Rice Co.

Miller's Pippin.—Size 5; form round conical, angular, or five-sided, and slightly ribbed at the top; color yellow in shade, deep red on sun side, and the skin quite thickly covered with grayish dots; stem medium long; cavity rather broad, slightly russeted at bottom; calyx open in a narrow, deep, ribbed basin; flesh yellowish-white, half fine; flavor mild sub-acid; quality only fair; season, October or earlier. Origin, Rice Co., Minn.

The seven Oldenberg seedlings of Jacob Zettle, Sturgeon Bay, Wis., will most likely be known and recognized by the numbers and description which I gave them at the late Wisconsin State Fair, until they are properly named by the originator or an authorized committee, and I will describe them as follows:

Zettle's No. 1.—Size 5; form roundish-cylindrical, slightly five-sided, angled; color mostly a pinkish red, splashed with deep red or carmine over a yellow ground and specked with gray dots on the sun side; stem medium short, set in a rather deep, yellow russeted cavity; calyx large and open in a medium broad, slightly angular basin; flesh yellow, nearly fine, firm, juicy; sub-acid or mild acid flavor; season, October. Originator says, "Tree is very hardy and a great bearer."

Zettel's No. 2.—Size 6 to 7; form round, slightly angular and tapering towards the eye; color a very light greenish-yellow or white, mostly covered on the sun side with rosy salmon and splashes of carmine, and skin thickly covered with irregular grayish dots; stem short in a rather deep, funnel-shaped cavity; calyx large and open in a medium, wrinkled basin; core medium, closed; flesh pale yellowish-white, nearly fine, tender, juicy; of a mild pleasant acid flavor; season, last of September. Originator says, "Tree is a great bearer, fruit always large; ten acres of it would be a fortune."

Zettel's No. 3.—Size 5, or full medium; form regular oval, slightly five-sided; color, when ripe, pale lemon yellow with blush and carmine spots on sun side; stem long in a narrow, regular cavity; calyx open in a medium, deeply furrowed basin; core small, nearly closed; flesh light yellow, nearly fine, tender; flavor sprightly sub-acid, very good; season, October.

Zettel's No. 4.—Size $4\frac{1}{2}$ to 5; form round cylindrical; color pale whitish-lemon in shade, blush on sun side, with a few round spots and whitish dots; stem short medium in a smooth, deep cavity, russeted at bottom; calyx open; basin broad, medium deep, wrinkled; core medium, partly open; flesh yellowish-white, nearly fine, tender, juicy; flavor pleasant acid; season, early winter. Originator says, "Tree hardy as an oak, good bearer; keeps until mid-winter."

Zettel's No. 5.—Size 4; form round ovate conical; color yellowish-green with blushed cheek sometimes splashed with deeper red; stem medium in a rather deep, funnel-shaped, russeted cavity; calyx closed, set in a small, corrugated basin; flesh nearly fine; flavor pleasant mild acid; core medium; season, October. Originator says, "Tree great bearer, fruit good shipper, not wormy."

Zettel's No. 6.—Size 6; form round oblate; color yellowish ground, mostly covered with red and splashed with crimson; stem medium in a regular, greenish, deep, funnel-shaped cavity; calyx large, open; basin broad, medium deep and ridged or wrinkled; flesh nearly white, fine, tender, juicy; flavor mild, pleasant acid; core medium, partly open; season, early October. Originator says, "Tree great bearer; fruit will not keep long."

Zettel's No. 7.—Size 7; form roundish; color light green and red striped; stem long in a medium deep, slightly russeted cavity;

calyx open in a medium deep, smooth basin; core open; flesh greenish-white, not quite fine; flavor acid; season, September. Originator says, "Tree fine, very hardy."

Every seedling mentioned in the above report is worthy of extensive trial and ought to be put in our experiment stations as soon as trees can be procured.

THE IDEAL HORTICULTURIST.

PROF. H. W. BREWSTER, UNIVERSITY FARM SCHOOL, ST. ANTHONY PARK.

The ideal horticulturist is neither a myth nor a mystery, but a concrete, living reality. He lives not only physically and financially but mentally, morally and aesthetically. He is ideal, not because he is lacking in the real, but because he is the highest type of the real. He is fitted both by natural taste and by special training to live and labor among fruits and flowers, to discover and utilize the scientific principles underlying the transformations of plant life, to cultivate, harvest and preserve nature's bounties, to minister with bountiful hand to the happiness and well-being of his fellow creatures and to love the beautiful, the true and the good in nature, in nature's children and in nature's God.

But what of the practical phase of this ideal character? Has he no money to make, no plans to push, no difficulties to overcome, no competition to meet, no scheming to thwart, no natural foes to circumvent, no storms to dread, no blight to escape, no plagues to avoid, no frosts to fear? Yes, indeed! He must have money, plans, push, vigilance, skill, patience and perseverance. But in, through and above each and all of these he must have faith, hope and charity; charity for every other struggling child of humanity, hope for the richest fruits and the choicest blessings both in this life and in the life to come, and faith not only in the bounty of nature and the wisdom and goodness of nature's God, but faith in the virtue, love and gratitude of God's human children.

The practical is an essential element in the character of the ideal horticulturist, and in many ways he should receive special training. He should study conditions of climate, qualities of soil, functions of plant organs, character and treatment of natural diseases, methods of propagating and cultivating, modes of harvesting, means of preserving, ways of marketing and the tricks of the trade in general. But, essential as is all this practical training, it is not that which gives character to the ideal horticulturist; it is, at best, only a means for realizing, in successful effort, such a character as can truly be called ideal. While it is essential to the highest success of a horticulturist and should characterize all his plans and labors, it should be subservient to that culture which develops true character.

When studying science the horticulturist should, in the universal laws governing all scientific deductions and generalizations, recognize the omniscience of the infinite mind; and when planning for future results and hopes, he should, in the personal form which

such plans and hopes ever assume, recognize the immortality of the finite soul. When studying the nature and results of competition and co-operation, he should recognize the fact that no one can live and rejoice alone, or suffer and die alone, but that we are all united in natural and indissolvable bonds of mutual sympathy, whereby we joy or sorrow together. When studying the various forms and colors that characterize specific qualities, he should learn not only to enjoy the harmony that pervades the beautiful in external nature, but also to feel the refined sympathy which aesthetic natures ever share in the presence of the beautiful.

Practical training is essential to the highest success in producing the flowers and fruitage of nature; mental, moral and aesthetic culture are essential to the development of the perfect flower and fruitage of true character. The ideal horticulturist must not only have both, the practical to make him successful in the perplexities and labors of his calling and the personal culture to develop his moral character, but he must place upon each its proper estimation and give to each its due consideration at the proper time. When he buys his land, fertilizes his soil, selects his seed, plants his fields, cultivates his ground, trains his vines, prunes his trees, kills his weeds, harvests his crops, he must be a geologist, a chemist, a physicist and a botanist as well as a horticulturist. When he markets his products, he must be a merchant or a peddler, a philosopher or a crank, a neighbor or a lawyer, all things to all men, as occasion requires. But in and through it all he should remember that his every success in raising and selling his crops is not an end but a means to an end. All his horticultural products must perish, and all the money received for them must be left for others; but the character which he develops is immortal, and the good which he does will remain as his own eternal reward.

The ideal horticulturist is deeply conscious of this truth, and every day of his life bears witness of the fact. His every plan is made not as a temporary means but as a factor in some permanent end. The beauty of his flowers is to him a source not only of passing pleasure but also of refined culture. The luscious richness of his fruits is a promise not only of quick sales and large profits for himself but also of happiness and blessing for others. His every success is a satisfaction not merely because it increases his wealth and magnifies his reputation, but because it brings him into sympathy with the happiness and good will of others. His highest ambition is to be thorough in all his plans, successful in all his efforts, faithful to all his duties and grateful for all his blessings. In so far as his ambition is realized, he is an ideal horticulturist.

A HORTICULTURAL ENTHUSIAST.

A. W. LATHAM, SEC'Y.

On August 7th last, a flying trip took the writer to Springfield, Minn., a pleasant town of some 1,200 population on the C. & N. W. Railway, about thirty miles west of New Ulm and one hundred and fifty from Minneapolis. If for no other reason, this day will be memorable as one in which the temperature stood at 104° in the shade, as it did in that village at 4 p. m. that day.

H. Knudson and his Hybrid Sand Cherry, the Compass.

This visit was made principally to see the somewhat noted hybrid cherry, the "Compass," which was originated by Mr. H. Knudson, of that place.

A good description of this hybrid appeared in the April number of the "Horticulturist," page 132, and as far as I had an opportunity to judge I can heartily endorse its candor and fairness. The original tree is now about eight or nine feet high and is just closing its fifth year of growth. Unfortunately, as Mr. Knudson reports, a severe hailstorm early in the season, cleaned off nearly all the fruit. A few only remained by which its quality could be tested. It partakes somewhat, of the characteristics of both parents, in that it has lost almost entirely the astringency of the sand cherry and has gained a little the flavor and consistency of the Miner plum. The fruit is dark red in color and a trifle less than one inch in diameter. The tree is one of exceeding vigor, and even on that excessively hot day, in a dry time, when neighboring trees were showing by drooping foliage the effects of such trying conditions, this hybrid cherry in the aggressive erectness and spread of every leaf proclaimed its extraordinary vitality. The value of this, and similar hardy crosses, in such a climate as that in which this originated cannot be questioned.

Aside from this seedling, there is much of value to note on the grounds of Mr. Knudson. He has the true spirit and methods of the enthusiast. In a garden of perhaps one-half an acre, surrounding his house, he has growing a great variety of all kinds of fruit apparently worth trying in this climate, including many seedlings and hybrids. Though scattered over the grounds with little method but with an evident purpose of utilizing every foot of space, the surface is kept scrupulously clean of grass and weeds. Mr. Knudson is evidently on the best of terms with every tree or plant on his grounds and handles and talks of them in much the same spirit a parent feels for the little ones who have been placed in his keeping. It is a kindly and earnest spirit that augurs well for results.

The list of varieties includes some thirty named sorts of apples, a number of pears, some forty of plums and many of native cherries, including the sand cherries, and a goodly number of small fruits and grapes.

Mr. Knudson's location is not a particularly favorable one. The country thereabouts is a gently rolling prairie, and while his place is on the higher ground, it is only a few feet, ten or fifteen, above the general level of the business part of the town, two blocks away—a location no better, certainly, than most of the farmers in that section might have for such a purpose. The oldest apple trees noticed were perhaps ten or twelve years old and comparatively healthy and vigorous. Limited time gave no opportunity to visit the surrounding country, but judging by what was seen there is very much to encourage the prospective fruit planter in that part of our state.

GRAPES.**E. J. CUTTS, HOWARD LAKE.**

The task assigned me this year is by no means a pleasant one, as it is much more agreeable to record success than failure. Yet the lessons learned from disaster are equally important and, I believe, better remembered. Owing to the extreme drouth of the past year or, I might say, the past three or four years, fruit bearing wood was not nearly as vigorous as it would have been if there had been more moisture in the soil. The very warm weather in April caused the buds to swell earlier than usual, and we had to take up our vines sooner than we wished. They were making a rapid growth, with fruit buds in abundance, when the severe frosts in June nearly ruined the prospective crops—I think, damaged it about two-thirds. To my surprise, the Janesville, which is usually considered the hardiest and which had made about two feet of growth, froze off down to the old wood, as did also the Champion; and although both varieties started out again and made rapid growth, there was no fruit worth mentioning. I think the Delaware, Brighton and Niagara suffered less than other varieties; Concord and Worden were more severely injured, as were also the Agawam and Lindley. It was very dry in our immediate vicinity, but owing, I believe, to frequent cultivation our vines did not suffer much from drouth, and the fruit ripened up very nicely, what there was of it, about two tons.

Just a word about varieties. While we consider the Brighton one of the very best, the fruit needs to be eaten as soon as ripe; if left on the vine long, it becomes quite insipid. The Agawam and Lindley are rapidly growing in favor in our section; the Woodruff Red has borne for us the past two seasons and we consider it a very desirable acquisition. We think the Niagara, all things considered, the best white grape; the Lady, while it is superior in quality, is a very feeble grower and quite tender. The Martha we have discarded, dug up every one in the vineyard; its quality is inferior to that of the Champion or the Janesville; its only redeeming feature is its productiveness.

I wish to mention another item of experience which has never happened to us before in some fifteen years. We had a young vineyard, consisting of about five hundred Delawares which had been set two years, nearly all root-killed last winter, and we recommend additional protection besides earth covering for two or three years after planting.

Another lesson we have been rather slow to learn and which may seem to some of little account—yet we consider it of some importance; when rows are running north and south, train the vine to to the north, as the prevailing winds during the growing season are from the south, and it is almost impossible to train a vine in good shape against the wind. (Train your vines to the east, when using an east and west trellis, for the same reason. Sec'y.)

Mr. G. J. Kellogg. How do you account for the loss of the five hundred Delawares?

Mr. Cutts. It was on account of the very severe winter.

Mr. Kellogg. Don't you think it was the dry fall?

Mr. Cutts. That may have had something to do with it, also the very early thaw in March and April and the severe weather afterwards. It never happened before.

Mr. Kellogg. I think it was the drouth.

Mr. Cutts. I remember down in Mr. Latham's territory, he had a similar experience.

Mr. C. Wedge. Which is your most favorable variety?

Mr. Cutts. I believe the Delaware, all things considered.

Mr. Wedge. How is the Moore's Early?

Mr. Cutts. It is a very fine grape, only it is a light bearer.

Prof. S. B. Green. How is the Pocklington?

Mr. Cutts. It mildews.

Mr. Wedge. Do you call the Niagara a profitable grape?

Mr. Cutts. It is of fair quality and bears immensely and ripens well.

Mr. C. W. Sampson. How do you like the Worden.

Mr. Cutts. I like it very well, but there is not such a demand for it as there is for the Concord.

Mr. A. H. Brackett. How does the Martha do with you?

Mr. Cutts. I have seen the Martha very highly recommended; this year we were so disgusted with it, we dug every one out.

Pres. Underwood, I would like to ask what is the best way to keep grapes.

Mr. Cutts. We have kept them until along in December by placing them in a cool cellar in layers.

Mr. Brackett. Has any one tried to keep them in borax? I have read several articles in regard to that.

Pres. Underwood. Has any one of you any knowledge of keeping grapes in borax? It is also recommended to keep them in some tight box surrounded with alcohol, just a sufficient quantity to keep the atmosphere intoxicated.

Mr. Kellogg. I always advise my customers that the best way to keep grapes is to sit right down and eat them.

Mr. Wedge. I have kept grapes repeatedly in our cellar by placing them in common market baskets with a layer of dry leaves or fine shavings between the layers of grapes and hanging from the ceiling in the cellar. The Lindley keeps very nicely that way.

Mr. Cutts. Two years ago I saw some grapes in Excelsior in December that had been hung in the cellar, and they were in good condition.

Mr. C. L. Smith. Leaves keep them very well; just put them in leaves.

FRUIT IN AITKEN COUNTY.**OTTO WASSERZIEHER, BAY LAKE.**

You want a brief sketch of our fruit raising in Aitken county. A few districts represent the whole. I planted apple trees in 1886 in Aitken county bought of Mr. Peter Gideon, Excelsior. I left the choice to him, and he sent Gideon, Lou, October, September, January and Florence. They all did very well for a time; I got three or four crops from them and then, was it blight?—or, I don't know, the trees began to die one after another, and now I have only the Florence and January and a few October half alive left. I planted and kept on planting every year. I tried Russians a year after I planted my first lot. Yellow Transparent, Repka, Malenka, sweet Anis and Step-lianka. The first and second of those bore several crops of nice, choice fruit, and then went the way of all apple trees. I have yet a few hundred Russians and seedlings growing and have the best of hopes for the future. Those seedlings I raised are from seeds obtained from Mr. P. Gideon, as he said from the best dessert apples—thanks to him! I shall be pleased to send some fruit to the station next year. My nearest neighbors, at Bay Lake, Crow Wing, too, commenced planting after my trees fruited and with good success—all Russian trees from the Iowa station. The Hazelton family, father and three sons, all with homesteads, are among our largest fruit growers. The tree peddler is a pest in this country; they not only sell at enormous prices, but they sell worthless and unhardy stuff, trees die and people get discouraged.

SIMPLE FRUIT PRESERVATIVE.—Details of a new process for keeping fruit in a fresh condition have recently been received from France. A scientist noted that pears and apples kept for several months in an atmosphere saturated with vapors of water and alcohol, and he resolved to carry the experiment further, with a view to learning the possibility of reducing the scheme to the requirements of every day needs and methods.

With this object in view the operator placed a variety of fruit, including grapes, together with a bottle containing sixty-one cubic inches of alcohol at 96 degrees in a brick receptacle from which the light and air were excluded by a common wooden door. In two similar receptacles, the door of one being left open and that of the other closed, but the alcohol being absent from both, other fruit was placed, and they were placed in a deep cellar, the atmosphere of which registered about 50 degrees. Twenty days later the contents of the two last named chambers were found to be absolutely worthless, but the receptacle in which the bottle of alcohol had also been placed presented a very different spectacle. Not only were the grapes firm, full and entirely free from mould, but the bloom upon them was found to be as fresh as though the bunch had just been taken from the vine. The chamber was closed for another month, and at the end of that period everything was still as fresh as formerly, and the freshness was evident equally as much in the taste as in the appearance.

These experiments have certainly added to our methods of fruit preserving a process which is not only inexpensive, but exceedingly useful.—Farmer's Voice.

CANNING OF VEGETABLES.

MRS. ADELAIDE C. SNYDER, ST. ANTHONY PARK.

This subject, "Cooking and Pantry Stores," is such an extensive one, that I have taken the liberty of subdividing it and have considered only the canning of vegetables.

The cheapness, abundance and fine quality of the vegetables during this past summer have much increased the interest in their preservation for winter use. The canning of vegetables is usually considered rather uncertain, but with care and some practice one may feel quite sure that the result will be satisfactory, and it is my intention in this short article to state some of the conditions that are the most essential to success.

During the winter months, when fresh fruits and vegetables are so much missed, good home-canned vegetables fill an important place, and it is a great comfort to know that the canned vegetables eaten by the family are perfectly wholesome and free from all chemical poisons and preservatives, that the pease are not colored with copper, and that they contain no salicylic acid. This acid, so commonly used in many of the canned vegetables, is objectionable because it seriously interferes with the normal digestion of the food.

The first requisite to success in canning is to have good cans. The question of getting perfect cans has become a troublesome one. Some makes that have hitherto been perfectly reliable are many of them imperfect. Of one dozen that I bought this summer every one leaked; there was a projection of glass along the seam at the neck of the can which prevented the rubber and lid from fitting tightly. This projection was removed with a file dipped in turpentine; in fact, glass can be filed like iron when the file is moistened with turpentine. The cans were thus made usable, but it would not do to trust them for vegetables nor for all kinds of fruit. The cheap cans with porcelain lined tops may also cause trouble on account of a lead cement being used in fastening in these porcelain linings, and which dissolves in the slightly acid juices of fruits and vegetables. The most satisfactory cans have a glass top and close with a spring. They are easy to close and open, and those who are familiar with some of the old kinds can appreciate the fact that one does not have to wait until the man of the house comes home before having a can opened.

Cans should all be tested before using. To do this, partially fill with hot water, secure the tops in place, wipe dry and stand the cans inverted for a few minutes, when a leak will show itself. It is safe not to use the rubbers a second time. They are now so cheap—three cents a dozen—that it is not economy to run the risk of spoiling a can of vegetables by using a poor rubber.

The second essential point in canning is to have all parts of the can and everything that comes in contact with the vegetables thoroughly sterilized before using. In the canning of fruit, simply covering with boiling water for a few minutes is sufficient, but for vegetables it is well to err upon the side of too great care. In the latter case put the cans into cold water and heat up gradually, let-

ting them boil for a few minutes, and cooling them in the water. This toughens the glass as well as sterilizes the cans.

As soon as the cans are cool, they are ready to use, but should not be allowed to stand around before using. Another way to sterilize the cans is to set them into a cool oven and gradually raise the temperature until it is hot as for bread and let the cans remain for an hour or two; then gradually cool off the oven. The sterilizing with hot air at this temperature is more thorough than with hot water. Of course, this must be done at the time they are needed, for if they are set away they will collect more germs. The thorough sterilizing of the cans and of all the utensils used in the canning of the vegetables is one of the vital points to insure success. The spoiling of the vegetables is due to fermentation, and to prevent fermentation the fermenting organisms must be entirely excluded. Many of the failures are due to the utensils not being thoroughly sterilized; hence, the spores that cause fermentation gain access to the material.

The third essential to success is that the vegetables shall be in good condition. They should not be over-ripe, neither should they be gathered while green and allowed to ripen after gathering. It is safe to have the vegetables a little on the green side rather than on the over-ripe side. If they are a little green, the long cooking that they receive in canning brings about the same change as the last stage of ripening. This change has been brought about by the action of heat, whereas, in the green gathered, artificially ripened vegetables this change has been brought about by ferments, which are the great enemies in the canning of vegetables. Vegetables should be canned as soon as possible after they are gathered.

To Can Pease.—Have fresh young pease—if they come from the market put into a colander and dip a few times into a pan of hot water. Shell and fill the cans as full as they will hold, shaking down well; then fill to overflowing with pure cold water. If the water is not the purest, it should be boiled and cooled—just when it is needed. It would be time lost to sterilize the cans and then fill them with water which contains more germs than the cans before they were sterilized. Put the lids on the cans but not the rubbers, and place the cans in a wash-boiler with a false bottom of wood or screening, having something between the cans to prevent their knocking together in boiling. Fill the boiler to the covers of the cans with cold water; let them come slowly to a boil and keep boiling four or five hours; after three hours boiling put on the rubbers and seal, and then boil another hour. At the end of that time, set the boiler off from the fire and let the cans stand in the water to cool. If the cans have screw tops, tighten often as they cool. During the boiling the cover of the boiler should be on. When the cans are cool, wipe dry, wrap in paper and store in a cool, dry, dark place. If there is any suspicion that the can may not be air tight, a good plan is to run a little melted paraffine along the seam where the lid joins the can. A convenient way of doing this is to use a paraffine candle. String beans, shelled beans and asparagus may be canned in the same way as pease.

To Can Corn.—Select corn suitable for table use, cut from the cob, scraping out the pulp as for stewing, and pack the corn into the cans, working it down well; fill heaping full and proceed as with pease.

To Can Tomatoes.—Tomatoes require cooking a long time. This long cooking produces a more concentrated and valuable food. Ordinarily one hundred pounds of tomatoes contain ninety-five pounds of water, and by the continued cooking one-half of this water is evaporated. They should always be cooked in porcelain or granite ware; they are slightly acid and are not wholesome when cooked in iron ware; they are apt to be discolored. Some persons object to so many seeds in canned tomatoes, in that case after the tomato is peeled and cut into two parts squeeze gently with the hand, and this will remove the seeds with a part of the juice. After the tomatoes are all prepared, strain this juice to remove the seeds and return the juice to be boiled with the pulp. The sugar and malic acid of tomatoes being soluble are present mainly in the juice instead of in the pulpy parts of the tomato, so if this juice were thrown out with the seeds a good share of the nourishment would be lost. Cook slowly in a fruit kettle for two or three hours, taking care to prevent scorching. Slow cooking for a longer time is better than more rapid cooking for a shorter time. The cans must be hot and the material boiling when it goes into them.

Not only may pease, beans, asparagus and tomatoes be successfully canned for home use, but also squash and pumpkins.

Summary of special points to be observed in the canning of vegetables.

1. All vegetables for canning should be as fresh as possible; if they are at all musty, they are quite sure to spoil, no matter how much care is taken in the canning. If they are over-ripe or have been standing for some time, they are not in the best condition, for soon after the vegetables are gathered they begin to undergo fermentation changes.

2. Perfect cans must be had and good rubbers, and the cans should be tested before using.

3. Everything that comes in contact with the vegetables should be thoroughly sterilized.

4. Cook thoroughly, and if they are vegetables that are cooked in a kettle have them boiling when they go into the cans, which must also be hot.

5. Store in a cool, dry, dark place, but remember that they freeze easier than fruit which contains sugar.

The Northern fall apples kept in cold storage preserve their flavor and do not decay quickly when brought out for sale in winter or spring. They come out of cold storage and hold up with unimpaired flavor as well as the winter apples from the cellars and have far quicker sale.

Such fall apples should be picked as soon as the seeds are brown in the fall, and should be barreled and put into cold storage at home or in market before their coloring is nearly complete, as experience has shown that all the Northern sorts will *will color up perfectly* in the barrel.—Prof. J. L. Budd, Arnes, Ia.

PROPER SIZE OF HIVES.

C. C. ALDRICH, MORRISTOWN, MINN.

As there has been a discussion going on through the bee journals as to the proper size of hives, and as I deem the subject of great importance, I will give my views.

By way of an introduction, I wish to say that I have kept bees in Minnesota for twenty-six years. I commenced with the standard hive, Langstroth pattern, and after having kept them five years I purchased three hives of a neighbor in the fall. I wintered them with my own. The last of May they swarmed, casting three swarms each, and the third swarm made twenty-five pounds of box honey each, while the Langstroth hives did not swarm until July and made scarcely any honey. The size of the hives bought were twelve inches square, and fourteen inches high. With this experience, I devised the hive I now use, and when I had fifty hives of the Langstroth and fifty of my own, every one of my own swarmed before I had any from the Langstroth.

Now, don't think that I am writing this to sell my hives, as I have no hives to sell. The patent has expired, and my health is such that I cannot make them. The size of my hive is fourteen inches square inside and eleven inches high. I am aware that where longer seasons can be had a larger hive can be used. I also wish to say that I am only writing of the body or brood chamber of a hive. Surplus can be used according to the strength of the colony. My reasons for believing that a small hive is best for Minnesota are:

First.—A hive should be no larger than to hold honey enough to winter, and until honey can be gathered in the spring.

Second.—That too much honey in the hive retards brood rearing, as we all know that all depends upon having all of the brood we can have hatched at the commencement of the honey harvest.

Third. When we take into consideration the labor of handling large and small hives and in putting them into and taking them out of the cellar, large hives require two men, the smaller, one man.

While there are many other reasons, I have not the time to give them.

TO PROTECT CHERRIES FROM BIRDS.—Of late years a new American mulberry tree has come into bearing, and it answers the purpose beautifully. It never fails to bear, is a long time in fruit, and the birds prefer its fruit to cherries and will go past the cherry trees any day to get mulberries. The birds begin upon the berries before they are ripe. This mulberry is a profuse bearer, the fruit is $1\frac{1}{4}$ inches long and black when ripe, is good for family use, is not so insipid as most mulberries and is especially good when mixed with currants. One or two mulberry trees planted near the cherry orchard makes the best safeguard against the depredations of birds I know of.—N. S. Platt, Connecticut State Pomologist.

STRAWBERRIES.—THE PROPAGATING BEDS.

CHARLES F. GARDNER, OSAGE, IOWA.

We often read that such a variety of strawberry has run out, meaning that it has become worthless. Where this is the case, it is because the plain rules, known to every true horticulturist, with regard to the nature, the habits and cultivation of the plant have been violated. The facts are that with proper management no variety will run out or deteriorate in value, no matter how long cultivated, but will grow better. Wilson's Albany or the Crescent, for example, where they have been handled right are today just as good or better than they were years ago when first introduced.

Growing plants for setting fruit beds is a peculiar and distinct department of horticultural science. The object is not to grow fruit but strong, vigorous, healthy plants to be used in setting fruit beds. In growing strawberries there are two distinct departments; in one you grow plants only, in the other you grow fruit only.

The size of the propagating beds depends on the number of plants you wish to grow. The rows are four feet apart and the plants three feet in the row. Take pains to get good, strong plants that are true to name to start with, if you have to pay a big price for them. The first year cut off all blossoms as fast as they appear and give the highest cultivation possible, as is usually recommended for strawberries.

The second year in the spring take up what plants you want for setting a new fruit bed but dig everything clean as you go, thus leaving a portion of the propagating bed undisturbed. Take some of the very best plants you can find and set out to extend your propagating bed. When fruit stems appear cut them all off as before, except on that part of the propagating bed left undisturbed, here leave two blossoms on each plant that will bear inspection. By this I mean that when the flowers are opened the stamens and pistils of perfect flowering kinds are carefully examined and all plants not showing proper development are hoed up and thrown away. In pistillate varieties choose those plants whose flowers are destitute of stamens and destroy the rest.

When the berries are ripe on the plants that have passed inspection give them another careful examination to determine which plants show the greatest number of points of excellence in the fruit, as to color, shape and, in fact, an ideal berry of that special variety. Mark those plants that are the nearest to perfection and dig up all the rest.

This course of treatment continued from year to year will produce plants of the highest degree of fruiting power, and is the method employed by those fruit growers who meet with the highest and continued success.

THE ITASCA PLUM.

This plum is the one described in the September "Secretary's Corner," under the heading of "A Freestone Plum." By request, Mr. J. Cole Doughty, the secretary of the Jewell Nursery Co., from whom the specimens were received, sent the following description and history of it:

ITASCA PLUM.

"The plum shown in the accompanying engraving originated in Aitkin Co., Minnesota, in latitude 46½ degrees, and was named Itasca on account of its origin being so near that famous lake at the head-waters of the Mississippi river. It was discovered by Mr. D. C. Hazelton, when clearing up land adjoining his fruit farm, and on account of the large size and excellent quality of the fruit he determined to preserve it. The tree is a rapid, vigorous grower, has a large, broad leaf, and bright, smooth bark. It fruits at a very early age, 480 large, well developed plums having been counted on a three year old tree.

"The following is a description of the fruit as given by Prof. E. S. Goff, Professor of Horticulture in the Wisconsin State University: 'Fruit oval, slightly truncate

at both ends, skin a nearly uniform deep dark red, without dots, a little paler on the shade side; cavity small and regular, suture very obscure; flesh rich yellow, tender, juicy and sweet, with scarcely a trace of astringency or acidity; skin remarkably thin and tender, so much so that it may be eaten with perfect impunity; stone large, but remarkably thin, obscurely margined.' "

Are there any of the cultivated varieties of the native plum which have originated so far north? As seen on the grounds of Mr. Underwood, at Lake City, two years since, topworked on other native plum trees, it appeared remarkable from the extraordinary size of the leaf which far surpassed that of any other plum within the writer's observation. A variety combining so many good points is likely to become a valuable addition to our list of hardy cultivated fruits. Sec'y.

October Calendar.

J. S. HARRIS, LA CRESCENT.

The present month may be said to close the season in the orchard and garden, and it offers an opportunity for looking back over the successes and failures of the busy growing months that are past. It is a time when the lesson to be drawn from the past may be a guide and inspiration for the future. In the retrospect it may be found that the failure in one case may have been due to imperfect preparation of the soil; in another the soil was not good or not adapted to the use to which it was put; in another case the varieties have not been judiciously selected, or they may have failed because cultivation was neglected, and the crop harvested was rank weeds instead of luscious fruit. Whatever was the cause, now is a possible time to investigate, find it out and prepare to guard against it in the future.

The Orchard.—In this climate we do not approve of setting trees in the autumn. In an occasional season, they will come through the winter all right, but ordinarily the roots do not get thoroughly established in their new quarters and cannot supply to the tree the moisture and life that is needed to replace that which is drawn out through the trunks and branches by the long, steady arctic weather of the winter. But it is in order to prepare the ground where an orchard is to be set in the spring as early as circumstances will permit. No damages arises from plowing it too deep or fitting it too thoroughly. If the land is level, it is best to plow by back furrowing in lands just as wide as the rows of trees are to be apart, and so that the open dead furrows will come just midway between them. If the soil is inclined to a stiff clay, the surface should be left rough until spring, that it may be better ameliorated by the action of frost. It is not advisable to plough the old orchard during this month, or not until it is positively known that trees have gone into their win-

ter's rest and will not be stimulated thereby to start a new flow of sap. Neither is it best to apply manure before next month.

A great many fruit trees and shrubs will be delivered to their patrons, by nurserymen, during this month. We advise a careful examination of the trees to ascertain that they are alive, have a sufficiency of roots and are free from scale, borers and other insects, before accepting them. This becomes more necessary because of the number of firms operating in this state who have no nursery in the state for propagating and growing trees, or only a block or town lot or two in which they summer over what they fail to work off in the spring. To save room, these trees are trenched in rows very thickly and do little more than live through the summer, and they are worthless for planting. As soon as good trees are received they should be heeled in or, rather, buried in a dry bank. The usual method is to dig a trench long enough to take in the trees, but deepest at the end where the roots are placed. Lay the trees in and fill with earth. No unfilled spaces should be left about the roots.

Currant or Gooseberries may still be pruned and cuttings planted out in the early part of the month. Pruning of grape vines may be done towards the last of the month, or as soon as the leaves have fallen, but they should not be covered for winter until later.

In the vegetable garden, the tops of asparagus should be cut and burned and a dressing of strawy, coarse manure applied to the ground. Beets, carrots, squashes, etc., should be gathered before frozen and carefully protected from freezing. All leisure time should be utilized in cleaning up the orchard and garden and getting ready for winter, and when cleaning grass and weeds from about trees look sharp for borers, and if any signs are found, dig out or kill by probing their burrows with a wire.

WILD FLOWERS AND THEIR CULTURE.—People usually make too much work of cultivating wild plants. They are apt to attempt to imitate the natural conditions under which they find the plants. This, to a certain extent, is wise, but in most cases it is easily carried too far. The problem is simplified when we once come to understand that wild plants grow where they are obliged to grow, rather than where they desire to grow. Because a plant grows in the woods is little reason to expect that it may not grow equally well in the sun. And then, it is not necessary to wait until fall or spring to take up the wild plants. At every outing, whatever the time of year—if the ground is not frozen—I mean to go prepared to bring home roots. In these sultry July days I am bringing home wild herbs, and next year I expect to see most of them bloom. I dig them up with a comfortable ball of earth, cut the tops off nearly to the ground, and keep them moist until I get them home; then they are set in the border, and if dry weather follows a little water given occasionally at sundown helps them to grow. I do not pretend to say that July is as good a time as April or October to remove plants, but one must capture the good things as he finds them.

Your Corner.

"I am very much interested in your magazine and wish our folks could publish one like it.

Corning, Ia., Aug. 10, 1895.

A. F. COLLMAN,"

Ex-Pres. Ia. State Hort. Society.

"The matter in your August number is well up in character. The seedling fruit notes are of great interest. The plan of Mr. Cross on forestry is good, and I see that my friend Fernow thinks so, too. He is well able to judge, as he knows of the *experience* of other countries where these matters have been tested in part already. I hear many good words of the Loudon raspberry *this year*. I tested it in the office before it was named and helped to name it. The Miller and King (both reds) ought to be well tested in Minnesota also.

Parksley, Va., Aug. 12, 1896.

H. E. VAN DEMAN."

"I would like to state that my red raspberry canes are afflicted with very small worms; they lay in layers inside the stalk and eat the stalk until it dies. Can any of the members of this society tell me what to do or what remedy to use? I would like to hear from some of them on this subject.

GEO. B. WIDGER."

Chatfield, Minn., Sept. 4, 1896.

"In the September number of the Minnesota Horticulturist I see Mr. Pendergast, of Duluth, has sent you a specimen of yellow clover. I have the same growing on my lawn. It is a very dwarf variety of clover, much smaller than the white clover, and is of no value unless it is for lawn, and I think the white clover superior to it for that.

C. W. CONNER."

Sac City, Ia., Sept. 4, 1896.

ENGLISH RULES FOR JUDGING FRUIT.—The following rules are in use by the Rural Horticultural Society, London: The fruit is judged by points, 12 being the maximum, and these points are distributed in the following proportion: For flavor, 6; for quality, 3; for appearance, 2; and for size, 1. It is explained that "quality" is intended to mean the degree of smoothness or meltingness of the flesh (the absence of grit), or, in case of early apples, crispness and juiciness of the flesh may be considered. Quality, therefore, refers mainly to the texture of the flesh. Appearance, of course, includes color and beauty of form; but size, which counts only one-twelfth in the estimate, does not mean that the largest fruit receives the highest marking. There is a type size, which invests the fruit with its greatest value for table use, and this is counted perfection. Enormous specimens are not preferred, since beyond a certain point size is a defect in dessert fruits.—Garden and Forest.

Secretary's Corner.

IOWA'S BIG APPLE.—A little account of the recent Iowa State Fair speaks of a Wolf River apple from the orchard of A. F. Collman, measuring $16\frac{1}{2}$ inches around and weighing $19\frac{1}{2}$ ounces. It just filled a half-gallon measure. Who has beaten that in Minnesota?

DEATH OF JOHN WRAGG.—The death of this prominent Iowa horticulturist occurred early in September. He was one of the oldest and best known nurserymen in the West and can be credited with having done very much in developing fruits suitable to his state.

CAN CUT-OVER PINE LANDS BE RE-FORESTED?—Mr. H. B. Ayers has been selected by the State Experiment Station to gather information and statistics on this important subject to be issued later in bulletin form. This knowledge is especially needed at this time in connection with the work now in progress of drafting a forest reserve law for presentation at the next legislature. Mr. Ayers has had a great deal of experience in the woods and is thoroughly qualified for this research.

AN EXHIBITION OF MINNESOTA FRUITS ON WHEELS.—The Jewell Nursery Co. has prepared a fine display of the fruits of Minnesota to be shown in a car to be sent out by the C. M. & St. Ry. Co., in the interest of immigration in the Northwest. As this car will travel extensively, it will serve a very useful purpose for this region. Of course the Nursery Co. are not in this altogether from philanthropic motives, but this move will incidentally work so much good for Minnesota that we may all well feel a hearty interest in it.

A SUCCESSFUL STATE FAIR.—The indications are that when the accounts of the late state fair are closed up, there will remain a balance in the treasury of about \$15,000. Few fair grounds in the country are better equipped than those of our own state already, and this royal surplus will enable the management to advance its rank by making some needed and useful improvements, amongst which we hope additional space and conveniences for the horticultural exhibit may not be overlooked. Would it not be good policy for us to ask for what we want?

A LONG CUCUMBER.—A cucumber $2\frac{1}{2}$ inches in diameter and $22\frac{1}{2}$ inches long, the dimensions of one brought into this office by Mrs. E. A. Cuzner, the wife of our assistant librarian, was a great curiosity to "ye editor." It would have made a fine "shillalah," and was just the right shade of green to have pleased the eye of its wielder. Mrs. Cuzner raises this variety, one of the English frame cucumbers, Sutton's Matchless, in a little conservatory attached to their house. They grow there suspended from above in ominous array. There are very few seeds in them, and the quality was found to be extra good.

THE COMMITTEE ON FORESTRY LEGISLATION.—This committee, appointed as a result of the action of our society at the summer meeting, is to hold its first meeting Tuesday, Sept. 29th. The committee at present consists of the following gentlemen: D. R. McGinnis and C. W. Horr, of St. Paul, Prof. W. W. Pendergast, Prof. S. B. Green and Capt. J. N. Cross. At least two additions will be made to this list. At this meeting a number of others interested in the subject have been invited to attend, and it is expected that substantial progress will be made towards the preparation of the proposed forestry law.

CLOSE ROOT PRUNING OF TRANSPLANTED TREES.—A late number of "The National Nurseryman" contains an interesting editorial on the new methods of root pruning trees for transplanting as advocated and practiced by H. M. Stringfellow. This method consists in cutting the roots back to an inch or so in length and shortening the top accordingly, evidently a practice confined to small sized trees. At least one thoroughly practical fruit-grower has become a convert to Mr. Stringfellow's theory, Mr. J. H. Hale, the noted peach grower of Connecticut and Georgia. Mr. Hale says on this subject:

"I am glad to state that the close root pruning which was practiced when planting our entire orchard of one hundred thousand trees at Fort Valley, Georgia, proved to be the most successful operation we ever practiced, less than one-half of one per cent of the trees failing to grow, and all making the most vigorous and even growth I have ever seen in any orchard in America. The orchard is now three years old, and gave us an enormous crop of fruit this past season. I am thoroughly in favor of this system of root pruning."

This practice is not, I believe, altogether new. In a limited way, I have followed it in planting my vineyards, cutting back the roots to about three inches, always with the best results.

Is anything, indeed, to be gained by trying to make room for long roots when the tops can be correspondingly shortened? What is the experience of others in our climate?

HONESTY IN HORTICULTURE.—Some of the agricultural journalists of the country have been caught by the following description of a very taking vegetable, which appeared in the daily papers:

CABBAGES ON VINES—A NEW DEAL IN VEGETABLES MADE BY NATURE IN IOWA.

LAKE PARK, IOWA, Aug. 6.—S. R. Buffum, a market gardener living near here, has one of the most remarkable vegetables on record. In his cabbage patch last year occurred a "sport," by which a plant, instead of making a head in true cabbage style, assumed the form of a vine. At the axis of its leaves thirteen cabbage heads of about two pounds weight were formed. The plant went to seed, something unusual for first year cabbage. The seeds were formed in the usual manner, all the earliest cabbages on the vine throwing out seeds stalk. Mr. Buffum saved the seed, and, on planting it this year, it grew well and many of the plants have assumed the vine-like habit of the parent, although the majority have returned to the natural form of cabbage. It is believed, however, that the vine variety can be established.

Mr. Buffum has been experimenting with the plants and finds that if the heads are cut off as soon as they attain a weight of about one pound, the vine, like cucumbers, will continue to form a large number of heads. The variety of cabbage from which the sport occurred was Salzer's Lightning. The vine cabbage is the most grotesque appearing plant imaginable. The leaves are thrown out in pairs, and the cabbages lie around under them like pumpkins. The vines are about ten

feet in length. The new variety is bound to become popular, owing to its remarkable bearing qualities, and also because it matures cabbage within two months from date of planting.

In response to a letter of inquiry the following reply came:

LAKE PARK, IOWA, Sept. 22, 1896.

A. W. Latham, Minneapolis, Minn.:

DEAR SIR:—In reply to yours of the 8th, will say the cabbage story is a fake—there is no truth in it whatever.

Yours, in the interest of *honest horticulture*,

S. R. BUFFUM.

Moral.—Go a little slow on new things. Their value may rest on a basis nearly as unsubstantial as the above—and yet, “prove all things and hold fast to that which is good.”

THE FORESTRY COMMITTEE MEETS.

At the last moment we are enabled to publish an account of the meeting held at the secretary's office Sept. 29th. Four members of the committee proper were in attendance, Chairman D. R. McGinnis, Capt. J. N. Cross, Prof. S. B. Green and Prof. W. W. Pendergast. The following gentlemen were present by invitation and participated in the deliberations, Gen. C. C. Andrews, Fire Warden; Mr. Wyman Elliot, Secretary J. O. Barrett, of the Forestry Association; Secretary E. W. Randall of the State Agricultural Society; Mr. T. J. Klein, representing the T. B. Walker Lumber Co.; Pres. J. M. Underwood and Secretary A. W. Latham of the Horticultural Society. The committee was organized by the election of A. W. Latham as secretary.

At the outset the following resolution was adopted as voicing the unanimous sentiment of those present as to the purposes to be accomplished in the organization of this committee.

Resolved, That the object of the forestry movement in the state of Minnesota and all legislation sought by it, is not to in anyway hamper or interfere with the use of the merchantable pine or other timber in this state, or to tie up agricultural lands. But its purpose is to protect life and property from forest fires, to increase a knowledge of the value of growing timber, to save the young growth on cut-over timber lands from fire and to protect the sources of our streams from drying up, so that we may have a continued supply of timber and fuel for the needs of our farming and manufacturing interests and a regular water supply for power and navigation.

The session was devoted to a general consideration of the subject in its many phases, in which all present took part. There was apparent a unanimity of sentiment as to the needs of our state in the direction of the subject under deliberation and as to the general means to be used in providing for them, and only the question of details remained to be considered. As the best way of accomplishing this, it was decided that the chairman should appoint a committee of three to prepare a draft of a bill to be presented at the next meeting for discussion and final action.

This committee will be announced later.

It was deemed advisable to increase the general committee by adding a member from the Miller's Association, which will increase the number to eight. It is the intention in the preparation of this bill to have a representation of the principal interests involved, so that as completed it may represent their common sentiment as to what is possible, desirable and practicable in the beneficent end sought to be attained.

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"THE NEW HORTICULTURE." BY FELLOW, OF GALVESTON

(A review).

F. H. NUTTER, MINNEAPOLIS

This is indeed a time of transition, and in our turn, we are confronted by the "new religion" and many other novelties well calculated to catch the popular mind, and it is not entirely unfitting that a book which should also appear upon the stage, though the author asserts that his theories are not really new, but methods by which nature has worked from

The book named above has been read with interest. It is very attractively written and printed, and contains the evolution of an enthusiastic horticulturist and disappointed business man.

Though written for a southern climate, the theories of gardening present many hints and expedients of consideration in our latitude, but when we consider his theories, and also his practice, in regard to transplanting trees and vines and as to the health and productiveness of the tree, doubtless will begin to be heard; for to take a thrifty tree, cut away all the roots till it has about the size of a small boy would consider an ideal "stump puller" lower end in a hole made with a crowbar, and then to expect the results to more than rival the ordinary methods, is certainly a startling

Our author presents his theories with confidence, for his opponent, backs them up with facts and arguments on his own part and that of others, which can only be successfully met by a direct denial. That his own particular locality is exempt from

On those who read it, the book will have different effects: to many it will bring helpful suggestions to thought and, doubtless, stimulate some to test the theories advanced we can surely say that it has been done in war time in regard to rumors from the South, if true." With others, especially if they belong to the school to whom the writer, doubtless, erroneously belongs, it will be wilfully opposed to him, it will be apt to produce perhaps profanity. Try it and see.

IN THE VEGETABLE GARDEN.

GEO. H. PRESCOTT, ALBERT LEA.

The first product of my garden is asparagus. There seems to be two ways of cutting it: first, as soon as it appears above ground, dig down a few inches and cut it off about four inches long—it is white, and some prefer it that way; second, let it grow about four inches high and cut even with the ground—I think it best this way.

We are advised to spread manure on in the fall, but I think it best to put a dressing of manure on as soon as done cutting and work it in two or three times until the growth gets high enough to shade the ground. By so doing, it will thaw out earlier in the spring, and you can cut it earlier. The first asparagus brings the money, and that is what we are after.

In the meantime, a few rows of beets and spinach should be planted for greens. Sow thickly in rows eighteen inches apart, and when large enough thin out by taking a handful and leaving about half as much in the row; and so continue to the end. Afterwards thin out to one plant. They will be about four inches apart and should be left until large enough to cook. Sow as early as possible, as frost does not injure much. Sow every ten days until Fourth of July.

Peas and onion sets should be planted as soon as the ground can be worked, also lettuce, as they will stand quite a heavy frost. Plant peas in rows quite thick, eighteen inches apart for Little Gem, which I consider the best for all purposes. Sow every ten days until the middle of July.

Plant onion sets one inch apart in the row, and rows twelve inches apart. I use any kind of small onions I have on hand. Pull out the largest for table use, until thinned to three or four inches apart in the row, which are left for cooking. Sow lettuce in rows one foot apart quite thick and thin out for use, leaving some for heading later on.

Sweet Corn. The Early Minnesota, with white cob, is as good as any. A row or two should be risked quite early, and if killed by frost the second planting ten days later will be all right. It should be planted every ten days until the middle of July—fresh, soft, sweet corn is in demand until killed by frost. Plant in rows three feet apart, one kernel in a hill, one foot apart in the row.

We must not forget our potatoes, if they are only ten cents a bushel now. Go into the cellar and take some with sprouts on, and be careful and not break or bruise the sprouts. Cut to one or two eyes, and plant in rows three feet apart and six inches apart in the row for Early Rose or Beauty of Hebron. If the frost cuts the tops a little, they will come out all right.

In former years I used to transplant my tomato and cabbage plants two or three times to give them a good root and make them stocky. I now let them grow in the hotbed until a foot high—tomatoes in blossom sometimes. In setting out I use a garden fork. Put it in the ground quite slanting, lifting the ground up enough to put the plant half the length of it in the ground, drop the dirt on it and press with the foot. Water if necessary. They seldom wilt when planted this way and develop a stronger root.

Plant cabbages two or three feet apart, according to the kind of cabbage. I put mine so close that the last time through the cultivator breaks off some of the leaves. The Dwarf Champion tomato suits me the best, yields well, is early, bears good showy fruit and can be picked more easily than those with larger vines. It should be planted close enough to entirely cover the ground at maturity. Ground cherries should be planted the same as tomatoes, putting one-half of the plant in the ground, if tall when setting out, to give them plenty of roots. They, like tomatoes, throw out roots the whole length of that part put in the ground. Some of you may think I am putting my plants too close together, but it seems to be a provision of nature for the earth to be covered with vegetation, and if the grower does not plant close enough weeds of all kinds will spring up until the ground is covered.

There is a great deal said about mulching but the true mulch is the crop you raise. Go to the forest where the trees are close enough together to shade (mulch) the ground, and when it does rain the moisture is kept until the trees need it. So it is in the potato patch; when the plants cover the ground it will be found cool and moist under the vines; where a few hills are missing, you will find weeds growing. When rows are wide apart, it is the same. So follow nature and plant close enough to cover the ground when the plant is about full grown.

THE PLUM, OR PEACH, CURCULIO is a native American insect, and is the chief enemy of all our choicest stone fruits. The perfect insect is a small, rough, brownish beetle, with some markings of shining black and ochre yellow. It is about one-fifth of an inch long, quite stout and with its beak and legs folded close to its body bears a close resemblance to a dried bud of the peach or plum. Its small but sharp jaws are on the end of a stout, curved beak. It comes out of its winter quarters early in the spring, and feeds sparingly on the opening leaf buds. Shortly after the young peaches or other fruits are formed, its work will be found upon them. Two sorts of punctures may be noticed; one a simple cut through the skin for the purpose of feeding upon the flesh underneath, the other larger and deeper, accompanied by the crescent-shaped slit, which marks the position of the egg. The cavity for the latter being prepared, the insect reverses its position and drops into it a single pearly white egg. The crescent is then cut, partly encircling it, apparently for the purpose of deadening the little flap, in order that the delicate egg may not be crushed by the too rapid growth of the fruit cells. The curculio is a long-lived insect, and the females continue the process of egg-laying at the rate of from two to five a day for a period of six weeks or two months, and, though but single-brooded, their period of activity is so long that their larvæ will be found in all but the latest varieties of peaches and plums, and even these will often be seriously marred by punctures made in feeding.

This insect hibernates in the perfect state around buildings and under the loose bark of forest trees or any other convenient shelter. The best remedies are trapping in the early spring by means of chips and cobs placed upon the carefully smoothed earth around the trees and by jarring from the trees upon cloths or in the regular curculio catcher. Spraying with the arsenites has not proved sufficiently successful to warrant its advocacy in the case of this insect.—Report Mo. State Horticultural Society, 1895.

STRAWBERRIES.**A DISCUSSION.**

Mr. A. H. Brackett: Would it not be a good idea to cover the strawberries before the ground freezes? Does not Mr. Wedge advocate that?

Mr. C. Wedge: I have had no experience in the matter, but I am covering my strawberries a little earlier each year. I am quite confident that a year ago we would have saved our plants in much better shape if we had covered them lightly.

Pres. J. M. Underwood: I should think the greatest danger to the plants is the alternate freezing and thawing that comes the latter part of October. On our place we make a practice of covering the beds as soon as we get a light freeze. The ground this fall was hard, and we could drive on just as well as if it was frozen. The plants have grown all they will grow and all they want to grow, and we can commence to cover with straw, and we never have had any trouble from covering them too close. If we had a warm spell, it might occasionally do a little harm.

Mr. J. P. West: How thick do you cover?

Pres. Underwood: We use clean straw, free from chaff and free of seeds, and it is thrown on lightly; the straw lays up very lightly, and you would say there was six inches of straw on, but when it comes to settle down there would not be more than three or four inches. I imagine marsh hay would cover them closer than rye straw.

Mr. West: What do you do with that in the spring?

Pres. Underwood: We rake it off and let it stay in the rows. In growing different varieties we have a wide row between so there will be plenty of room to pile the mulch. If the ground is hard, we take that mulching off and lay it in a large windrow, and if it is necessary put it back, but if the ground is in good condition and the weather is moist too and we find we can get along without that extra work, we do it.

Mr. West: What time in the spring do you find it best to uncover plants?

Pres. Underwood: A large part of our strawberry ground is intended for plants, and those we have to uncover earlier. If you dig from beds in the fall season, it makes it necessary to cover those beds earlier, because if you let them stay there after having dug around the roots, I think it weakens them—that is, those plants that are left there in the spring. If I could I would leave the mulching on as late as possible, on account of keeping them back. I do not know that it does keep them back, but it does some, perhaps. If you took the mulching off early, you might have to put it back again.

Mr. F. W. Kimball: Would it put back the blossom?

Pres. Underwood: I do not know; I never experimented in that way. I satisfied myself that you can keep fruit trees back by mulching, but, perhaps, strawberries you can not. How is it, Prof. Green, can you keep strawberries back by keeping the mulching on?

Prof. S. B. Green: Yes, a good deal.

Pres. Underwood: How much?

Prof. Green: I don't know just how much. I know some years there was a difference of ten days or more.

Pres. Underwood: It would be desirable to keep it on then?

Mr. Brackett: I always keep mine on until the leaves begin to bleach.

Mr. D. Cook: How much later does it keep the fruit back?

Prof. Green: Some of mine have been kept back ten days.

Pres. Underwood: I am afraid Mr. Cook is trying to get me into a hole.

Mr. Cook: I have kept the blossoms back ten days, but the fruit not more than three or four days.

Mr. W. J. Kellogg: I do not think you can retard the fruit more than three days, and you can retard the blossom no more than the fruit. I came up here to learn how to grow two hundred bushels of strawberries to the acre every year without so much expense. (Laughter.)

Mr. A. J. Philips: There was one point in Mr. Hopkins' paper that was perhaps lost sight of by some; it gave me a little information, and that was in reference to putting down canes. In traveling over the northern portion of our state, where there are some large plantations located, every man invariably said this: "I never laid down my canes when they laid down so easy." I never heard any one say why it was, but Mr. Hopkins said he believed after quite a freeze if the canes thawed out they were more pliable. This year we had a freeze. There were quite a lot of potatoes in the ground, but it was sufficient to freeze them so they will never be dug. Warm weather came along afterwards, and the people laid down their canes, and I think Mr. Hopkins' head is level on that subject; I think it is the freezing and thawing that made them lay down so easy.

Mr. Brackett: I had no trouble at all with breaking in laying down my berries. I do not lay them so low; I cover them with hay instead of with earth.

Pres. Underwood: Do you find that sufficient?

Mr. Brackett: That has been sufficient so far; I never have had any trouble.

Mr. Philips: We have in Wisconsin this year more dirt than hay. (Laughter.)

Mr. C. F. Gardner of Iowa: Is it a wise thing to wilt anything to lay it down easy?

Mr. Philips of Wisconsin: That would be a question to test next spring.

Pres. Underwood: I do not know whether it would do if you had a large plantation to cover. I think the growth of the vines can be directed a good deal during the summer so they will lay down easily, and if a vine has been laid down once it has a natural inclination to lie down again. I think it is a good idea to educate them to lie down, like the turkeys who laid down and stuck up their legs to be tied. (Laughter.)

Mr. Philips, of Wisconsin: They used to tell that in Wisconsin about the chickens when the preachers came around. (Laughter.)

A CITY ORCHARD.

H. R. BIRCH, 1706 SOUTH SIXTH ST., MINNEAPOLIS.

In the year 1875, twenty years ago, I bought one-half doz. Duchess apple trees of Wyman Elliot. I dug out a space about six feet in diameter and about fifteen inches deep, and set out my trees about ten feet apart—I set them that near together on account of space, for I had only two lots at that time. Then I put in one-half dozen or so of round cobble stones, from three to six inches in diameter, the large ones under the largest roots of each tree. I think the stones retain the moisture in summer, and in the spring they hold the frost in the ground and prevent the trees from budding so early in the spring, and that prevents the late frosts from injuring the fruit.

When I hoe my garden I rake up all around each tree all of the weeds, sticks and stones that I find, and then I put a little earth on top to make my garden look well; but any good mulching will do.

My trees have borne apples every year since they first commenced to bear, but this fall has beat any past record. I raised twenty-four bushels of nice apples from four trees. Two trees died on account of being set out too near my well, which was twenty feet deep. I did not have hydrant water until 1889, since which time I have had plenty of water in summer.

Duchess apple trees ought to be protected from the south side of the body of the tree. But where the fun comes in is in scaring the boys away from stealing your apples. To scare the boys I recommend a shotgun in plain sight of the boys and a high board fence.

Mr. A. J. Philips: Did you have a good crop this year?

Mr. Birch: I had twenty-four bushels from four trees. I sold \$16.00 worth of apples.

Mr. Clarence Wedge: How many trees did you say you had?

Mr. Birch: I planted six trees, but two of them died.

Mr. Wedge: What kind of soil have you?

Mr. Birch: It is a rich loam, about a foot deep, with a little sand sprinkled in, then it goes down about three feet into clay hard pan, that will nearly hold water.

MARKETING GRAPES.—Grapes, like other fruits, need to be carefully handled to bring the best prices. The vines need to be gone over frequently during the ripening season, gathering only those with full color, because grapes do not, like other fruits, color after being gathered. The bunches should be cut off with a pair of scissors and so handled as not to disturb the bloom. Ordinary varieties may be at once packed from the vines into the basket that is intended for sale. Choice varieties should be gathered in shallow trays or baskets, in which they should stand a day or two on shelves in the fruit house, and then re-packed. By this treatment the stems will wilt, and the bunches will then keep without molding and pack more closely than when green.—*Canadian Horticulturist*.

TO PROTECT THE BEAUTY OF THE WOODS.

G. F. SCHWARTZ, NUENDEN, GERMANY.

It may not be generally realized that scientific forestry, though of inestimable value to a growing country, may in time despoil the woodland scenery of much of its highest charm. If this is so, what is the remedy? It seems to me that it might be desirable to include in the prospective managing boards of our forest interests, whether state or national, some person or persons whose influence should count for the aesthetic value of our forests. In such a staff of directors, for instance, as were proposed by Mr. Judson N. Cross, of Minneapolis, in his scheme for restoring and preserving the Minnesota woods, might it not be proper under these conditions to include some authority on art, somebody with a recognized understanding and appreciation of the beautiful in nature?

When I say that scientific forestry tends to mar the beauty of woodland scenery, I refer to the changes in outward appearances that natural forests undergo as a result of some of the methods prescribed by scientific forestry. On the whole, such forests, in time, assume a strikingly artificial look: they show the evidence of man's handling's and interference for some purpose. The trees, where planted or systematically sown, stand in monotonous rows or squares. The transition from undergrowth to standing forest is often abrupt and unpleasant. Again, there is not infrequently a systematic lopping of the lower branches, through which the crowns of the trees are raised to an awkward and unnatural height. At a distance the artificiality of such woods is still more obtrusive. They are apt to look patched and pieced together, incongruous in outline and form of surface and discordant in combination of color. An irregular strip of young beeches, for instance, may be followed by a patch of full grown pines, and this in turn by a bare spot ready for an aftergrowth. As a rule, there is wanting that graceful outline, soft blending of shades and fitness in detail that nature, left to herself, so well knows how to produce.

In detailing these effects of scientific forestry, I have only tried to show that scientific forestry methods do, in fact, influence undesirably the outward appearance of forests. The effects I have spoken of are mostly the results of important principles of forestry and cannot be sweepingly removed. And yet, something may, perhaps, be done to mitigate their effect. It is plain, of course, that, on the whole, forestry must be allowed free scope. It should be remembered that forestry is an art as well as a science, and that, according to the conditions of soil, climate and so forth, cases may arise where one method would serve nearly as well as another. If in some way the primeval aspect of a characteristic bit of scenery might be preserved without seriously departing from the main principles of the best forestry practice, might not such a departure be justified? I have in mind a part of the woods belonging to the city of Stuttgart, Wurtemberg, which lies several miles from the city on a hill. In this case, an order was given several years ago that these woods should at no time be cleared, like the surrounding forest, but that

reforestation should be effected through natural seeding or planting in order that the dense beauty of the green forest might stand uninterruptedly an agreeable sight to the citizens. We may, perhaps, assume or at least hope that our system of forest management will be more pliable and elastic than the forestry systems of European countries, because our civil institutions are less rigid and bureaucratic than theirs; which leads me to believe that instances like the one I have cited might with us be made of still wider application. It is even conceivable that special cases might arise where the exceptional beauty of the landscape might warrant an entire subordination to it of the question of material gain aimed at by forestry. Aside from this, the critic I have proposed could exercise his powers in certain other specific ways. He could, for instance, select exceptionally beautiful or otherwise remarkable individual trees for special protection and preservation. It occurs to me that the selection of wooded areas for country parks, etc., might likewise be entrusted to his care.

In this way it would be possible to retain something of the pristine beauty of our scenery, and some of the best influences of nature, so constantly threatened in various ways by "progress and civilization," might be preserved.—*Garden and Forest*.

NATIVE EVERGREENS.

H. B. AYRES, CARLTON.

With little experience in cultivating, I have doubted my usefulness as a member of this committee.

Impressions as to what treatment the several plants like have been formed not by personal care of them but merely by seeing them under various circumstances, whether in cultivation or wild. These remarks, therefore, should be received with sharp criticism, and the pros and cons should be well considered before going to expense or making any venture based upon them; but if the woods man can help the prairie man in his need or make the city man happier by reminding him of or leading him to the restful retreats of the forest, he is only glad to have the privilege.

There is reason why the prairie people of Minnesota should be deeply interested in evergreens, especially in the trees. We have a great diversity of soil and climate. Analyses and the yields of favorable seasons show most of the soil to be very rich in plant food, and our problem is how to prepare and serve this food for our plants, that they may grow fat and fine and always yield us good crops. Experience has been slowly and expensively teaching us that on the prairie trees are desired not merely for ornament and for their wood, but that windbreaks and groves are needed to check evaporation and otherwise regulate moisture and temper the air. But we have not always succeeded in growing windbreaks and groves. We need to be learning the hardy trees and the way to treat them.

If we begin on the Atlantic coast and travel northwestward across the continent, we find farms follow the hardwood, but unfavorable

soil and climate among the conifers. Toward the summits of mountains and upon the borders of other barrens where trees have a struggle for existence (and fires are not prevalent), we find the picket line to be of evergreens. As a rule, we find them enduring greater extremes of temperature, more and drier wind, less fertile soil and less moisture than deciduous trees. These were the ideas acted upon when Dr. Fernow planted jack and Norway pine from Minnesota in the sand hills of Nebraska. The experiment proved an eminent success, the jack pine (*Pinus banksiana*), direct from the forest, proving the hardiest of all the many trees planted there. I do not know what trials have been made in Minnesota; I have not heard of these two pines being tried; even if they have been tried and have failed, perhaps some essential provision nature makes has been overlooked. For a striking illustration of such provision, take the spruces and firs growing in exposed situations: they have their lower branches longer than those above, and those of the black spruce especially, vine-like, run out upon the ground forming a dense mat about the base of the tree. The snow, falling upon this mat is kept off the ground, and the higher branches, weighted down at the same time, form an air space that extends well up the tree, causing a much more even temperature about the lower trunk. The snow forms a cone-shaped downy blanket that regulates the temperature, keeps the ground from freezing deeply and protects against drying winds. In applying this suggestion, select seedlings with their lower branches well developed and, in addition, even pile some brush around them or set something like a barrel with heads out over the small trees before the ground freezes.

Each of our native evergreen trees and shrubs will now be mentioned with some remarks. Some of you may be surprised, but first in order of usefulness for planting in sandy and gravelly soils in exposed situations for windbreaks, groves, fuel, fencing, even lumber—yes, and far better than nothing for ornament, is:

PINUS BANKSIANA—Lambert (*Banksian*, or *Jack Pine*). Plant it as early as the frost is out deep enough to plant, and let it have the moisture from the thawing ground. It cannot be planted too densely. With it, for groves and timber, plant the red, or Norway, pine from twenty to thirty feet apart. The two go together, the jack pine acting as a nurse to the Norway. Under the most favorable circumstances jack pine has been seen 125 feet high and two feet on the stump. It is now cut by lumbermen with other timber.

PINUS RESINOSA—Aiton (*Red*, or *Norway Pine*). It is sturdy in appearance when young, like the Scotch and Austrian pines, and is fully as beautiful. It is one of the few evergreens that will thrive without branches on the lower trunk. If properly managed, at thirty years and upward it will make a most attractive grove. Such groves are occasionally found in our northern forest. The upper branches join, the lower have disappeared, leaving clear yellowish-brown or bronze colored trunks supporting the wide dome overhead, in which the winds whisper and the birds nest and sing. The ground in these groves is free from brush and is covered with the clean, bright leaves the trees have shed, forming a great assembly ground the Goths would come far to find, and from which all vandals should be

carefully excluded. When such a spot is found in the woods, one readily agrees with Bryant in saying: "The groves were God's first temples."

TSUGA CANADENSIS—Carriere. (*Hemlock*). When grown in good soil with plenty of room and moisture it is probably our most beautiful native for the lawn. Its slender, graceful branches, with the silvery bloom under the leaves, its conical yet gentle outlines tempt one to try every means to make it a success. But it may be hard to do this away from its favorite haunts, where it finds the shelter of other trees, fertile loam and constant moisture. Here let me mention another hemlock for introduction, *Tsuga Pattoniana*, of Montana, a remarkably beautiful tree, growing high up the mountains, where it is much exposed. It may be perfectly hardy here.

- **PICEA ALBA**—Link (*White Spruce*) and **ABIES BALSAMEA** (*Balsam Fir*) stand next in my favor for ornamental planting. They are often remarkably beautiful on the alluvial banks of streams in mountain regions. *Picea alba* and *abies subalpina* grow together in Montana and seem there even more rigorous than the white spruce and balsam here. It may be advisable to get seed and seedlings from there for nursery stock. The white spruce resembles the Norway spruce somewhat. It grows tall and large and is valuable for timber. It is eminently a Northwestern tree, forming large timber forests in Manitoba and the Northwest Territory. It is doubtless more hardy on the prairie than the fir, yet it likes shelter. It is the most ready conifer to come in under the birch and poplar that follow forest fires.

The fir is not a large tree, seldom exceeding seventy feet in height and eighteen inches in diameter. It is valuable not only for its beautiful form and foliage and its dense shade, but about the home it is desirable for its medicinal properties. The "blister" in the bark contains the most healing salve the woodman knows and an excellent remedy for nasal and pulmonary diseases. Even the resinous odor thrown off from the leaves on warm days is very healthful, and some people use pillows made of them. A well watered subsoil seems to be necessary for these two trees.

PICEA NIGRA—Link (*Black Spruce*). This has a natural distribution northward. It is principally confined to the sphagnum bogs or muskegs. (It is sometimes called the muskeg spruce). There it grows more slowly, sometimes being only an inch in diameter at seventy-five years old, and uncouth, even weird in aspect; sometimes devoid of all limbs except a tuft of very short fruiting branches at the very top; but on sandy upland with damp subsoil and plenty of shelter, it develops much beauty. Its upper, or fruiting, branches, very short, stiff and compact, form spires resembling but not as slender as those of the balsam fir, or, occasionally, an inverted napiform ball. The middle branches often droop considerably, ascending, however, at the tip. Sometimes they hang like vines close to the trunk (as shown in engraving), the very lowest, when present running out upon the ground. Some individuals of this form are very beautiful. This is not a large tree. It is seldom more than seventy feet high and ten inches in diameter. This as well as the

Black Spruce (*Picea nigra*).—Upland form.

white spruce is subject to disfigurement by an insect that lays its eggs in the twigs.

THUGA OCCIDENTALS—Linnaeus. (*White Cedar, or Arbor Vitae*) is probably so well known it need merely be mentioned.

It is found native almost exclusively on wet land, but, like the cypress of the South, thrives on dry uplands, too. Like most other trees, it flourishes in the alluvial soil along streams, where it is sometimes found three feet in diameter and a hundred high. Some of these very old trees have the greatest attractiveness. Crippled and decrepit they may be, but their broken branches healed over or half the tree living while the other half is dead indicate that they are veterans whose history we would like to know. But for lessons in life—

PINUS STROBUS—Linnaeus (*White Pine*) is probably the best teacher. Some one has said of trees and he must have been looking at old white pine timber trees when he said it:

"Trees are our teachers

If we but read their silent lives aright.

Rooted in clay they lift their heads toward light."

Tender when young, starting under the shade of other trees, it seems to pause, just above the ground, then, decided, upward it goes straight and true until it reaches the branches of older trees. Here it pauses again, waiting for an opening, enduring the whippings of the branches above it; its buds repeatedly broken off, suffering for light and air, yet persisting, as if knowing an opening there will be if it holds out long enough. When it does come at last, up springs our pine. Once above the other trees it is free and stretches out its great strong beautiful arms for the first greetings of the rising and the last of the setting sun and shakes defiance at the storms, as if to guard the forest of smaller trees above which it towers. This tree is monumental of manhood and should be planted in memory of those men we wish to honor and of the old pine forest that has done so much for Minnesota.

Unfortunately for the planter, its grander qualities do not develop until the tree is a hundred years old or more; yet it is undeniably pretty during its youth when open grown.

JUNIPERUS VIRGINIANA—Linnaeus (*Red Cedar*). This is one of the few trees that cross the continent, and whether by the roadsides and fences of Virginia, on the bold rocky ledges of New England, hiding secluded upon islands in Minnesota lakes or proving its endurance in the foot hills of Montana, it is an interesting and valuable tree. It is not especially beautiful, is of slow growth and yet is valuable for its colored and fragrant wood, its odor, its berries and its hardness. It may succeed for hedges and windbreaks where many others fail. It likes lime, and I would suggest its careful trial on the chalky, alkaline and gypsum soils of Minnesota and Dakota.

JUNIPERUS COMMUNIS—Linnaeus (*Low Juniper*). This is quite common. It is interesting because of its form, and is valuable for the lawn as an easily kept and clean shrub that will not obstruct the view. Its natural form is between saucer and bowl shape, will rise to about four feet in height, and with a little clipping grows very compact. A third of this genus is:

JUNIPERUS SABINA—L. var. *procumbens*—Pursh (*Trailing Juniper*). This modest and hardy little shrub has its own peculiar ways, and whether upon the summits of buttes in Dakota or on the lake shores of Minnesota, it likes to be alone. Alone let it be then and plant it on sandy or gravelly mounds where nothing else will grow! Let it have the hot summer sun and the cold winter wind! Let sands drift over it and let roots be piled upon it, for then it will multiply and thrive! Trailing down from the summit of a mound of white or brown sand, it is remarkably beautiful. Several plants were seen last summer tinged with yellow or golden tipped. These should perhaps be named variety *aurea*.

A White Pine Forest in Northern Minnesota.

TAXUS BACCATA—var. *Canadensis*—Willd. (*Ground Hemlock*) another trailing, or rather a creeping shrub, seeks the deep cool shade of cedar and fir and black spruce on the borders of swamps and the banks of streams. If its language were interpreted, it would say, whether to warn of danger or to guard some sacred spot, "keep out." If you try to pass it, it will probably trip you. Its foliage is dark green. Its curious red fruit is rare. It spreads by rooting branches and sometimes rises to six feet above the ground. It may be valuable as a border or protecting shrub with plenty of

moisture. In the woods, it is often found blighted when the trees have been cut from over it.

This ends the list of trees and shrubs, but the smaller plants are not necessarily of less importance. The strong trees are placed first, because if the finer sentiments are not readily awakened the big trees compel an impression of some sort.

Under the protection of the trees—and no grove seems complete without it—grows:

GAULTHERIA PROCUMBENS—L. (*Wintergreen, or Tea Berry, or Checker Berry*). At the red school-house near the old Quaker meeting-house where I went to school, the boys used to go a mile at noon time to get wintergreen for the girls. Whether to catch the reflection of its crimson berries upon their cheeks or to perfume their breaths with the young leaves, I do not know.

ARCTOSTAPHYLOS *ura ursi*—Sprengel (*Bear Berry*) is a trailing vine with durable, astringent, red berries. It prefers or rather, perhaps, is crowded upon poor clay soils and may be desirable to cover clayey spots where little else will grow. It sometimes forms a dense mat like myrtle.

I had wished to note all the evergreens, but the field is too large.

The four species of lycopodium that grow here must not pass unmentioned. They are valuable for Christmas and other trimmings and in some of the Eastern cities are brought into market in large quantities.

There are many more among herbaceous plants that may be desirable to plant in suitable locations when arranging pleasure grounds, especially upon the prairie; for what a pleasure it is for prairie people whose homes were once in or near woods to find the old friends of their childhood can be moved and will thrive in the new location with them.

My little favorite the partridge berry, (MITCHELLA REPENS Linnaeus) is saved to mention last. A common name, an humble plant, a modest but beautiful trailing vine; but the sweetest of blossoms and lasting pleasant fruit make it an easy kindness to hold it up for admiration.

SORTING APPLES.—The ease and convenience in assorting apples can be greatly enhanced by using a table constructed for the purpose as follows: Length 7 feet, width $3\frac{1}{2}$ feet, height 3 feet. The top should consist of canvas or oilcloth securely nailed to the frame, strips three inches wide of inch stuff, and, for convenience, openings should be left in each corner large enough to admit a half bushel basket. These rest on supports fastened to the legs of the table, the latter being made three inches wide and two inches thick, all well braced. The writer can vouch for the ease, comfort and facility of the work performed by its aid, and could not be induced to return to the tiresome, back-aching method of sorting on the ground. Not being patented, they are free to all, and are truly a great acquisition, not only in the apple orchard but are desirable for handling pears and quinces as well.—*Farm and Vineyard*.

THE APPLE AS AN ORNAMENTAL TREE.

C. G. GRAY.

Fashion long ago banished the apple tree from the lawn and park and substituted various ornamental trees and shrubs. We obtain our ideas of the apple tree from those that grow in neglected or badly kept orchards. The tree is left to run riot part of the time and is then assailed with ax and saw, usually by the hired man, who neither knows nor cares. Its symmetry is destroyed, and blood poisoning enters through the stumps of its amputated limbs. Cattle and horses browse off all the twigs they can reach, so that between men and farm-stock the tree is diseased, ungainly and does not live out half its days.

It is but rarely that an apple tree is given room, protected from browsing animals, properly pruned and permitted to develop its natural beauty. It will produce a leafy dome with limbs drooping on all sides to the ground, its clusters of apples almost or quite reaching the sod. As a flowering tree, it has no superior. No blossoms are more dainty, delicately fragrant or abundant, and if the fruit be well chosen for effect its dark green foliage will be jeweled with scarlet or yellow; and the fruit retains, in full, the fragrance of the bloom. It has no equal as a shade tree, sifting only sufficient sunlight down into its closed pantheon to render it cheerful.

It so happened that an acre lot which I improved six years ago contained about twenty apple trees. They were a hopeless looking community—mere bramble-tops of sprouts and dead limbs set upon decayed boles. But I undertook to do what I could for them, gave the sod a shallow plowing, employed fertilizers, pruned carefully, painting over the stumps of the limbs which were sawed off, and have since used the shears upon the sprouts two or three times each summer. The transformation is entire. They produce large crops of apples, and there are more pears than can be used. But it is not as an orchard that I would speak of it, but as a park. The lot is regarded as the handsomest in the suburb, and I doubt if it has its equal, in a plain sort of way, in any village. I notice strangers, as they pass, pausing to admire it. There is almost no expense in caring for it; I do it myself of evenings. If those apple trees were removed, it would depreciate the selling value of the property very seriously. Those old, dying apple trees have now made it too fine a place for a printer-man like myself—but then I shall have to leave it soon any way, and I want to break myself in for the heavenly paradise before I go to it. I shall say to Father Adam, "This is all very fine, especially the river, but then, dear Grandpa, you ought to see my lot in Oak Park."

It is a maxim of architecture and of all art, even that of a lady's dress, that decoration for the sake of the decoration is not beauty. Utility will bear ornamentation, but it must not be smothered in it. A lawn or park should be beautified with shrubs and trees, but it must not be made to look like a nursery. It is an ample out-door room, breezier and better lighted and more attractive every way

than any apartment under shingles. Trees that are wholly useless, ornamental only, do not yield beauty. There is no sentiment in a clipped juniper. A shade tree has ideas, and an apple tree is full of them—of fond associations, and pleasant memories, which appeal to every one, most strongly to the country bred. The fashion which banished the apple tree from lawn and park was a vain affectation.—*Interior.*

ENTOMOLOGY IN 1895.

J. S. HARRIS, LA CRESCENT.

Although I have studied the habits of some insects to a limited extent and have observed enough to know the difference between a June bug and a black hornet by the sensation that follows too close a proximity to an angry specimen of the latter, I do not pose as a thoroughbred entomologist, or even know enough about the fascinating science of "bug"-ology to warrant trespassing upon your valuable time with such a report as I am able to give.

Everybody knows that we had a rather dry season in 1895, with sufficient warmth for all fruiting purposes—and such a season is generally considered favorable for the multiplication and fullest development of most kinds of injurious insects, as well as the beneficial. We had a plenty of bloom on cherry, plum, and apple trees from the 25th of April until the 10th of May. During that period no frosts occurred, and mornings the thermometer marked from 40° to 68° above zero. On every fair day during that time bees were working in the blossoms, and some days the trees were literally swarming with small flies. The result was that the blossoms were thoroughly pollenized and the set of fruit was immense.

I am glad to note that there was a very great scarcity of the pest commonly known as the potato beetle, which was very fortunate, as the low price which the product is bringing would have made it unprofitable to administer the usual remedies. The beetles that came out in the spring were too premature, and their early food was cut short by frosts; many perished through starvation, and they were so weakened by the long frost that their eggs and young larvae was deficient and mostly destroyed by the lady bug and other parasites, that were reasonably plentiful. May beetles made their appearance at the proper time in unusual numbers, and as there was a notable scarcity of birds that usually feed upon them, it may reasonably be expected that in meadows and foul grounds that had sufficient vegetable covering to induce the females to seek them as proper places for depositing their eggs, they will in about two years show a liberal crop of white grubs, and those who grow strawberries should be careful to select ground for new plantations that in 1895 was kept in a clean state of cultivation.

The codling moth and apple gouger were to be found in goodly numbers, and, as is common in years of a rather short apple crop, a large proportion of it was appropriated by them to be used in the reproduction of their species. One sign that is somewhat hopeful is that the extremely warm spells in September induced numbers of the late broods to come to early maturity and transform into perfect

insects so late in the fall that they may experience considerable difficulty in surviving the winter, and should their numbers be greatly reduced next spring will be a feasible time to commence waging war against them. It is hoped that more insectivorous birds will come to the horticulturist's aid in the coming year. Only such as are ordinary winter residents, like the blue jay, owl and young woodpecker, have been promptly on hand at the time of need. I have not seen one single pair of bluebirds during the year, while robins and other thrushes are comparatively scarce.

The round and flat headed tree borers are on the increase in this section of the state and are doing more than the usual damage to young trees. A considerable number of infested trees have been sold to our unsuspecting farmers by agents of irresponsible firms that practice picking up poor grades of stock and disposing of it in that manner, and if they are encouraged in it by finding ready purchasers, it will soon become necessary to provide for the inspection and disinfection of all nursery stock before it is allowed to be delivered and planted. It will prove wise for every planter to examine trees for borers before setting them out and afterward keep a faithful lookout for them. Considerable fears were expressed during the early part of the season that the destructive San Jose scale might soon be introduced into our state through the importation of trees from some Eastern nurseries where it had found a lodgment, but so far I have not been able to learn of a single tree that has been attacked by it. In southeastern Minnesota, the gooseberry, or currant worm has not been as injurious as in a few past years, and on my own place not a single specimen was observed. It is probable that by a united effort in the application of remedies by all who grow these fruits, they may be effectually exterminated. Either hot water, white hellebore or Paris green are sure remedies. In extreme cases we should advise taking off all the fruit and using Paris green, but where not too numerous and if treated in season the crop of fruit may be preserved by using the other remedies, and then if another brood appears after the fruit is gathered use a solution of the Paris green in water.

FRUIT TREES BY THE ROADSIDE.—Tell us if you know any good reason for planting maples, elms and the like along the roadsides in place of the practically useful cherries, chestnuts, walnuts and other fruit trees, especially out in the country where the depredations of fruit-hungry city boys are not much to be feared. Or if one must have forest trees, why not the linden, that will after a while enable our bees to gather the choicest honey in abundance?

When a Spaniard eats a peach or pear by the roadside, wherever he is, he digs a hole in the ground with his foot and covers the seed. Consequently, all over Spain by the roadside and elsewhere, fruit in great abundance tempts the taste and may be picked and eaten by anybody. This fruit is a great boon to tired and thirsty travelers.—*The Garden.*

WINDMILL IRRIGATION.

(Selected.)

Nearly every farmer can find a few acres on his farm with a water supply, either from well or creek, and a surface suitable for irrigation. On sandy plains, which are usually level, large tracts of land are fitted for this system of farming, being leveled down or filled up in order to make the entire field or set of fields, present a proper surface for flooding. The instructions here given are not intended to apply to such cases as are furnished with water by means of large irrigation ditches controlled by corporations. Lands in the vicinity of these ditches are usually thoroughly surveyed, and at great expense the entire country in the vicinity is leveled off and properly arranged.

In those regions called semi-arid, where only an occasional watering is needed, other than that given by nature, farmers, in general, do not attempt to irrigate their entire holdings but only a small acreage of garden, root crops, fruit trees and occasionally a grass plot. Such places being isolated from any general irrigation system, much economy must be looked for in the use of water, which usually must be pumped up from small streams or wells of varying depths. Whether the water be obtained from either of these sources, the farmer can choose for himself, taking that system which will be cheapest and most suitable to his location and surroundings. The questions which confront every farmer in starting out at this kind of work are: How large must the reservoir be in order to irrigate a field of a certain acreage? How must this reservoir be constructed? Can I, without enormous expense, water my crop if my land is rolling to such an extent as to make flooding impossible? How much water will be needed?

THE SIX FUNDAMENTAL PRINCIPLES OF WINDMILL IRRIGATION.

First, and very important, an open well and ample supply of water.

Second, a first-class, small, steel windmill.

Third, a windmill at least thirty feet above all wind obstructions.

Fourth, a good brass cylinder pump, with large openings through valves.

Fifth, a reservoir of sufficient capacity so that the water can be allowed to rush on the land in a large volume, thoroughly soaking it to a considerable depth.

Sixth, the entire capacity of the windmill utilized for three-quarters of the year, and the ground thoroughly flooded and saturated in the winter time, when there is the least heat to dry it up and interfere with irrigating.

THE RESERVOIR.

Too much importance cannot be given to the necessity of sending over the ground a large volume of water at one time. It must be a flooding of the ground, not a moistening. In most cases, the greater the depth of water that is put on the ground at one time the better; hence, the necessity of an ample sized reservoir. In no case should one be less than fifty feet in diameter, with walls that

will hold water four or five feet deep, and a larger reservoir is preferable. Where a small reservoir is used, a correspondingly small piece of ground must be flooded each time, and the flooding must be done oftener.

The best form of reservoir is round. A round reservoir exposes less wall through which the water can seep, and from which it can dry out, and is easier to build. In a round reservoir fifty feet in diameter and four feet deep; there is thirteen per cent less wall surface than in a reservoir of equal capacity built up square, and if the reservoir were built long and narrow the amount of wall surface in proportion to its holding capacity would be vastly increased. However, in the opinion of some, reservoirs should be built oblong, say fifty feet wide and one hundred feet long, or one hundred feet wide and two hundred feet long, etc., and extending at right angles to the prevailing wind, as the momentum of the waves in traveling a considerable distance will be likely to injure the banks.

A location should be secured, if possible, with hardpan or tough clay subsoil. If possible, place it on the highest part of the plot to be irrigated and as near as possible to the source of the water. If there is any slope whatever, let it be away from the reservoir. It should be borne in mind that hillside, as well as level ground, can be profitably irrigated if proper care is taken in the location of the reservoir. Occasionally good results are obtained by building a dam across some depression, thus necessitating an artificial bank only on two sides of the reservoir. Sometimes, also, a sloping depression on a hillside is enclosed at the lowest part by a substantial dam. Most reservoirs are made by simply scraping up from the outside of the reservoir a ridge of dirt sufficiently high to give four, five or six feet of water on the inside. No dirt should be thrown up from the inside of the reservoir, because it is desirable to keep the bottom of the reservoir as high as the surrounding land, and because the surface of the ground holds water much better than the strata further down. However, if there is any sod upon the ground where the embankments are to be made, the ground under the locality of the embankment should be thoroughly ploughed, and the sods removed, as sod is not a proper material for the construction of embankments, and there would always remain a possibility of water seeping through at the bottom of the embankment.

Now, with an ordinary scraper commence scraping up soil from the outside of the reservoir to form the embankment. The earth should be thoroughly leveled, pounded and packed as it is thrown in place. No attempt should be made to mix rock or other material with the dirt composing the walls. The embankment should be very wide at the bottom sloping up very gradually from the inside, as the waves would destroy perpendicular embankments. Walls from four to six feet in height are usually to be preferred.

When the embankments are constructed, it is well to fill the tank partly full with water and allow it to seep out. While the bottom is still muddy, turn into the reservoir horses and cattle and drive them

around for many hours, thoroughly puddling and pulverizing the ground. Some invert a scraper and with two teams of horses drive around upon the inside of the inclosure riding on the scraper. If this work is done thoroughly, you will have a reservoir which is practically water tight. In sandy soil it is well to haul in old straw and hay, scatter it around and tramp it into the mud as much as possible. If the bottom should continue to seep still, it will be necessary to haul in a few loads of earth or clay. Every Western farmer knows of the dry buffalo lakes that are found everywhere upon the great plains. Material taken from these lakes is most excellent for the construction of the bottom of a reservoir. Additional hay or straw can be put in, and it will in time make the bottom of the reservoir practically tight.

There exists no necessity except in some extreme cases for the use of cement, pitch or tar, as the reservoirs, by hauling in a sufficient quantity of mud, clay or even the magnesia deposits that are found all over the West, can be made practically impervious to water. The dirt walls upon the inside are much better if sodded; otherwise they are likely to cause trouble by the washing of waves. An excellent plan is to riprap the embankment on the inside, if stone can be had. By riprapping, we mean to place stone closely together without order on the inside of the embankment. It is often the case that planks are thrown into the reservoir, which will of course be blown to the opposite side from which the wind is blowing, which will prevent in a measure the waves from washing against the bank. An excellent plan is to plant water willows all around the embankment, which will in a short time grow up and serve as a very effectual windbreak.

In the construction of reservoirs where the depth of wells is such that much power and expense is required to lift the water, great care should be exercised in their construction. It is well in such cases to make a deep reservoir. These should be constructed more slowly than where the mills are pumping from shallow depths. Build up the sides of the reservoir about two feet in height, then turn in the horses and cattle and allow the puddling operation to go on for a couple of weeks; then raise the banks another foot, and continue the process as before. In this way reservoirs can be made upon the upland where the depth of water within the reservoir can be maintained at a depth of seven or eight feet. This will insure less evaporation and, therefore, greater economy.

MAIN DITCH.

If the ground to be irrigated is in the immediate vicinity of the reservoir, the main ditch should lead away from the end of the flume, conducting the water directly to those parts of the field that are to be irrigated. If necessary to convey the water any great distance from the reservoir, a small lateral or raised ditch should be constructed. The discharge pipe of the reservoir should be of sufficient size to allow a large amount of water to be discharged through it. This will give sufficient head or force to carry the water on rapidly through the lateral to a point at a distance where it should be ap-

plied, and but little water will be lost by seepage. However, much is to be gained by using a trough, or flume, say ten or twelve inches square, built of one-inch board, as the water will then be conducted without any loss to the point where it is needed. If the water is to be taken down a heavy incline, say two-and-one-half or three feet to the hundred, it should be carried in a wooden flume; otherwise, it will wash away the bank and make dangerous ditches. The main ditch for an orchard can be built up of one-inch board, with openings opposite each tree. These openings are to be filled with round wooden plugs when the water is not needed.

THE FLUME.

Before beginning to build the walls of a reservoir, choose the side from which the water is to be taken and build a long trough or flume of 2-inch plank not spliced, 12 or 14 inches square. This flume on the inside should be placed at such a height that not all of the water can be withdrawn from the reservoir. If this is not done, the water in the reservoir might dry out, and the mud that has been so carefully packed will crack, and the process of re-puddling will have to be gone over again. The flume should be sawed off on the inside at an angle of about 45 degrees. A cover should be made to fit carefully over the opening. Upon one side of the cover should be securely fastened a leather gasket. Any suitable hinge may be used for fastening this over to the flume, and it is well to put a heavy weight on the top of the cover. In order to lift the gate, two pieces of 2x4 can be placed in an "A" shaped manner above and a little back from the gate. This will be steadied by a third additional piece of timber running back and nailed to the side of the box, forming a tripod. On the top of this can be attached a lever, the short end of which is to be connected by means of a wire to the gate.

Great care should be exercised in placing the flume in the ground, and it should be more firmly tamped than any other portion of the embankment, as the water will have a tendency to flow alongside of the flume and cause a break in the reservoir.

If the water is discharged with too great a velocity, a water apron can be made to receive the force of the water.

APPLICATION OF WATER TO LAND BY FURROW SYSTEM.

The proper time to commence applying the water to the land on sunshiny days would be about four o'clock in the afternoon, and continue the work until dark. This gives ample time for water to soak into the ground, and the plants will not be injured by scalding.

The favorite method of supplying water to crops in semi-arid regions, especially where the ground is not absolutely level, is by flooding each row or every alternate row of the crop. Sufficient head should be given where the rows of corn, potatoes, vegetables, etc., are of considerable length to carry the water rapidly forward, so that the end of the furrow at the greatest distance from the conveying lateral will receive its proportionate share of the water. If a field is planted with potatoes, for instance, they are to be planted so the

entire length of each row is nearly on the level. If the field is on the hillside or on an incline, the furrow should not run down the hill but crosswise in such a manner that there will be only a very slight incline to each row.

The feeding ditch from the reservoir, which in this case need be only about 18 inches deep and the same in width, can be run along at one end of the rows mentioned. When the water is allowed to rush out of the reservoir, a boy can stand at the first row in the field and break down the wall at the lateral ditch, so that the water will rush in and flood one row. The walls of the ditch are then broken down, allowing the water to follow adjacent rows, and while it is filling them the boy can repair the wall in front of the first row; and thus the work is continued until the entire field is irrigated between the rows. A portable dam may be used to close up the ditch at each place where the water escapes, being moved from point to point as needed. If your reservoir is ample in size, two or three furrows may be irrigated at the same time.

THE FLOODING SYSTEM AND PREPARATION OF THE LAND.

Where the ground is comparatively level, the most satisfactory method for distributing the water will be by flooding. To do this, the farmer should carefully observe the surface of the field, and by means of plow and scraper level down any small elevations, so that the entire surface may be brought down to one general level. The field should then be divided up into oblong patches about 15 or 20 feet wide, though in some instances they are made as wide as 50 feet. These patches of ground should end up at the main ditch, so that the water can flow out of it upon the beds, one at a time. These beds referred to are separated from each other by ridges a foot or more in height. They are generally made by a scraper, constructed of planks, shaped like the runners of a sled, with the exception that the planks are put in the form of the letter "A," with the front about 8 feet wide, and the other end cut off so as to leave an opening 15 or 18 inches wide. Planks should be securely nailed at intervals across the top to hold the scraper together. By hitching to the wide end and driving across the field, the dirt will be gathered in and left behind in a ridge. These ridges should be thoroughly smoothed and packed, so they may not cause trouble by the water breaking through. The length of the beds will vary according to the size of the reservoir, the kind of soil, the slope of the land, etc.; they range from 200 to 1,000 feet long. These beds should be leveled off as smoothly and evenly as possible. In a field so arranged, fall and winter flooding may be followed.

For flooding at any time of the year, the reservoir should be allowed to fill up and then suddenly discharged in a large stream, thoroughly and quickly covering the entire bed. This is possible in winter, as your reservoir will not freeze over if you are continually pumping into it, unless, of course, the reservoir is unusually large in comparison to the amount of water pumped. Where this system of flooding is followed, it will usually suffice to flood the ground thoroughly during the late fall and early winter. If a dry spring follows, another flooding may be given in June or July, just

as the crop is setting. Any surplus of water put on the land in the fall or winter need not be drained off, but in summer the crop may be injured if the subsoil is such that under drainage is not possible. In such cases the ridges around each lot will furnish ample drainage by making an opening and discharging the water into the next lot.

FRUIT TREES.

In the economical use of water a large number of acres of fruit trees can be successfully and cheaply irrigated, even where it is necessary to raise the water from a depth of 200 feet. If the owners of orchards should procure ordinary drainage tiles without sockets, and place them perpendicularly at a distance of four feet on each side of the trees, and convey the water by pipes, or other means where great economy is necessary, into these tiles during the growing season, a very small amount of water will accomplish great results. The tile should be about six inches in diameter and eighteen inches long, imbedded in the ground. By this method all the water is conveyed below the surface, and there is very little loss by evaporation. This causes the roots of the tree to go down where the earth is cool, and the tiles do not become choked up with roots, as is the case when they are laid under the ground horizontally. With orchards it is never advisable to allow the water to come in contact with the trunk of the tree. Small ridges of earth should be thrown up around the tree to as to protect the bark from the water.

USE A SMALL WINDMILL.

We should emphatically advocate the use of wheels not larger than 8 or 12 feet in diameter where the lift is not over 25 feet, and in very many other cases where the lift is 50 feet they can be used to advantage. Where all the conditions laid down are complied with, an 8 or 12 foot wheel should easily irrigate 10 or 15 acres. To flow water through open ditches to land more remote is a waste of water and a waste of labor—better put up another small plant there. Huge irrigating schemes are generally huge failures. The big ditches near Garden City are pretty nearly always out of water when it is needed most. That is why windmills are now being used; they are more reliable.

Any one who will observe the six conditions laid down can raise the same amount of produce on the same ground every year without fail. In this work there is no gambling on the weather nor praying for rain, but it must be borne in mind that any excuse, however ingenious, for not complying with the above six conditions will not help the crop. Some of the additional reasons for using small irrigating outfits may be of interest.

First. They are within the reach of all in cost.

Second. They are most easily and safely cared for by the careless and shiftless.

Third. While it is easy to get a water supply for the small wheel, it is not for the large one.

Fourth. When the elevation is not great, it is much more economical in every respect to pump the water to the surface where it is

wanted than to do the work and suffer the wastage incident to flowing it to distant points.

Fifth. Even where irrigation or windmill irrigation is not necessary or desirable at all times, the use of an 8-foot outfit will insure a large family and some stock with a livelihood every year. All is not chanced on the weather.

In nine cases out of ten farmers wish to irrigate only from three to five acres of garden, root crops and fruit. Where they are suitably located, many will wish to irrigate tracts much larger than this. It will usually be found, however, that a large area which is to be irrigated can be divided off into several smaller ones, each of which can be supplied with a small reservoir, and will therefore be independent of all others. Another advantage gained by using small outfits is that the farmer who is inexperienced might fail in carrying out an extended system, while if a small outfit is used at first, he can, as his knowledge of the subject increases, add to this by establishing a similar outfit in the adjacent field.

WIND OBSTRUCTIONS.

Another of the most potent causes of failure in the use of windmills for irrigation is wind obstructions. Were we to lay down the rule just as we would like to see it carried out for all windmills put up for irrigating purposes, we would say, never put up a windmill unless you have it thirty feet above all wind obstructions. In this vicinity are one-half dozen places where wind is used for irrigating purposes, where they do not secure water enough to irrigate more than three or four acres from a 12-foot wheel. In most cases this failure is due to the fact that they do not get the windmill up to where the wind can reach it. In several of these places, the wheels are hardly visible above the groves in which they are placed. That they get any results whatever from them is more surprising than that they do not get more. The best results can never be obtained unless the windmill is at least thirty feet above trees and houses in the vicinity. A grove or clump of trees ten or fifteen rods away to the south, west or northwest may almost wholly destroy the efficiency of the windmill when the wind blows from those prevailing directions. Many say that they do not like to go up on a high windmill tower. Then don't waste time in putting up a windmill; get your water supply from the ditch. If you contemplate using a windmill, you must put it up so that the wind will get a full sweep at it. It is safer, and it is the only way to get results. You are not putting up a windmill as a matter of convenience, but to raise water for irrigation purposes, and should not, therefore, give much consideration to the small matter of convenience in climbing the tower to oil and look after the wheel, when this feature is of such infinitely small importance as compared with the desirability of getting the wheel up where you will get the best results. If you contemplate putting in a 12-foot wheel down low, it will serve your purpose just as well to take an 8-foot wheel and put it up high. You will get more from it than you will from the 12-foot wheel put down behind the obstructions.

COST OF WINDMILL AND PUMP.

The cost of irrigating outfits should be exceedingly small. If any one asks you more than \$25 for the best 8-foot galvanized steel wheel, he is asking you too much; better send right to the factory and buy it yourself. Of course you will have to pay in addition to these prices, freight from Chicago, cost of the tower and erecting the outfit; but these prices buy the best thing there is made in the way of a steel wheel. Add to this the cost of a pump such as is described above, \$15 for pump for an 8-foot wheel. Of course, you will have to pay freight on the pump also, but the best pump can be had for these prices, and the best steel wheel can be had at these prices; and if your local dealer will not furnish them at these prices, write to the factory direct. It is all you should pay, besides freight and the cost of erecting. Bear in mind that we do not believe in large plants; we believe in small ones and more of them.

MANITOBA FRUITS.

Speaking of the Rockwood Electoral Division Agricultural Exhibition held at Stonewall, Manitoba, on the seventh of October, of the present year, the Stonewall (Manitoba) *Argus*, says:

Perhaps no other exhibit attracted so much attention as the display of Manitoba fruits collected and arranged by Mr. Thos. Frankland. Many visitors were surprised to note the degree of success which had attended the efforts of that gentleman and his friends at other provincial points. We give the list of fruits in the collection:

From A. P. Stevenson, Nelson: APPLES—Wealthy, Whitney. CRABS—Hyslop, Transcendent, Virginia, Sweet Russet, General Grant, Montreal Beauty. PLUMS—Newton Egg, Luedloff. GRAPES—Moore's Early.

From Nelson Bedford, Glencross: CRABS—Transcendent, Hyslop. PLUMS—Desota.

From W. B. Hall, Headingly: APPLES—Wealthy. CRABS—Yellow Siberian Hyslop, Transcendent, Red Siberian.

From J. O. Cradham, Portage la Prairie: APPLES—Oldenberg. CRABS—Transcendent, Hyslop.

From J. J. Routledge, Miami: CRABS—Hyslop, Transcendent.

From Joseph Tottle, Stonewall: APPLES—Excelsior.

From Colin McLean: CRAB—Hyslop.

From T. Frankland, Stonewall: APPLES—Recumbent, Anisim, Whitney, October, Hybrid Seedling. CRABS—Sweet Russet, Hyslop, Orange Hybrid, 'Tonka, Yellow Siberian, Seedling. GRAPES—Seedling. PLUMS—Collection.

From W. Saunderson, Souris: PLUMS—Collection.

KEEPING TOMATOES.—Prof. Massey, of the North Carolina Experiment Station, writes the Garden and Forest that when frost is imminent he gathers the green tomatoes, wraps them separately in paper (old newspapers will answer) and packs them in boxes, which are stored in a place just warm enough to be secure from frost, the object being to keep them and not to ripen them. Then, as the fruits are wanted, a few of them are brought out at a time and placed in a warm position, where they will ripen in a few days. In this way he has kept his table supplied with sliced tomatoes up to midwinter.

A PROLIFIC DUCHESS TREE.

The apple tree shown in the accompanying engraving is a Duchess twenty-five or twenty-six years old. It is in perfect condition (excepting the broken limb to be seen on the ground), and at the time this photograph was taken had over twenty bushels of apples on, and two bushels had been picked off, mostly from the broken limb. The orchard in which it stands is situated at the head of a little coolie, about half way up the hillside, on an eastern slope, and about three-quarters of a mile from the Mississippi river, at the home of W. S. Widmoyer, in the town of Dresbach, Winona Co., Minn. Probably this is a fair type of a large number of similar trees, scattered through the southern half of the state, which were planted a quarter of a century since.

COOKING AND PANTRY STORES.

MRS. E. CROSS, SAUK RAPIDS.

YEAST.—Take six large potatoes, boil in two quarts of water; take a handful of hops, tie in a cloth and boil in the potato water; when cool add a half cup of sugar, a half cup of salt, a tablespoonful of ginger and one yeast cake; let it get frothy and bottle it. It will keep for six months.

BREAD.—One cup of this yeast with two quarts of water sponged over night will make four or five loaves of bread. I make my graham in the same way.

GRAHAM WAFERS.—A half pound of graham flour, a half pint of sweet cream and a pinch of salt. Mix quickly and thoroughly and roll out as thin as possible, prick and bake in a quick oven.

DELICIOUS DOUGHNUTS.—Take one quart of flour, one cup of sugar, one cup of sweet milk, one egg, a pinch of salt, one teaspoonful of saleratus and two of cream of tartar. Fry in lard. This is a tested receipt.

ROLL JELLY CAKE.—One and one-half cups of sugar, one cup of milk, two cups of flour and one teaspoonful of soda.

LAYER COCOANUT CAKE.—Two cups of flour, a cup and a half of sugar, half cup of sweet milk, half cup of butter, four eggs—leaving out the white of one to use for filling; beat stiff and put in the cocoanut.

FILLING FOR CAKE.—This is made by putting one cup of powdered sugar into a saucepan with one quarter of a cup of water. Let them simmer gently until the sugar is dissolved and, in fact, stiff when dropped into cold water; then add the white of one egg beaten to a stiff froth, half a cup of chopped raisins and a tablespoonful of cocoanut; flavor with vanilla. This makes an excellent icing by leaving out raisins and cocoanut.

RHUBARB PIE.—One and one-half teacups of rhubarb, cut fine, pour boiling water over and turn off; one half teacup raisins cut in two, three-fourths teacup granulated sugar. Mix all together. Sprinkle with flour; beat one egg and spread over the top; put on upper crust and bake.

A Duchess Apple Tree on the Grounds of W. S. Wilmer, Jr., Proctor, Minn.

WATERMELON PRESERVES.—Pare off the outside green rind; cut in pieces an inch square and put on with water and baking soda to boil. To six pounds of melon take one teaspoonful of soda, boil until tender, then drain off the water. Then dissolve the sugar in a little water, and put the sugar and melon on the stove to boil together until the melon is clear. (Take a pound of sugar to a pound of melon). Then drain off the sugar and boil to a thick syrup and pour it over the melon.

SWEET PEACH PICKLE.—Pare clingstone peaches and pack in jars; use three pounds of sugar to every seven pounds of fruit, and more vinegar than enough to cover them. Tie the spices in a cloth and simmer with the vinegar and sugar an hour. Then pour over the peaches. Cover tight while hot. Will be ready for use in three weeks. Splendid, and will keep any length of time.

CELERY.—Celery is invaluable as a food for those suffering from rheumatism or diseases of the nerves and nervous dyspepsia.

CELERY SOUP.—Take one cupful of chopped celery, a quart of milk, a tablespoonful of flour; butter, salt and pepper to the taste; stew the celery until soft enough to rub through a colander; to this pulp add the milk boiling hot; thicken with the flour rubbed smooth in the butter; add salt and pepper.

CABBAGE SALAD.—Slice cabbage off very fine; place in a dish and sprinkle a little salt over and mix it up thoroughly; let it stand one-half hour; then squeeze the liquor, or juice, off by taking a portion of it in both hands and pressing, then placing it in another dish. For a dressing, take the yolks of two hard boiled eggs and rub them smooth with one tablespoonful of made mustard, pepper, one-quarter teaspoonful sugar, one tablespoonful melted butter and a half teacupful of vinegar. Add at last one-half teacupful of sweet cream, and beat all thoroughly with an egg beater. Pour over the cabbage and garnish with whites of eggs cut in slices.

HOT MILK AS A NUTRIMENT.—If any one doubts the nourishing properties of milk, let a test be made of the following preparations of it. When any one is very weary or weak from exhaustion, heat some milk to the scalding point, until a thin skin begins to wrinkle upon the surface, and then drink it as hot as possible. It refreshes almost instantly, and restores the exhausted vitality to a surprising extent as soon as it is taken. It is more nutritious than any of the beef teas made from meat extracts or that made from fresh beef which is carefully strained, as many of the recipes direct that it shall be.

THE USE OF CREAM.—There are many people who need the nourishment to the system which cod-liver oil would give, but their stomachs refuse to accept it. Sweet cream is a highly recommended substitute for the oil, being a nutritious food which can be taken by those inclined to consumption or having feeble digestion, and also by aged persons.

WILL IT PAY TO GROW THE BLACK WALNUT?

J. R. CUMMINS, EDEN PRAIRIE.

The northern limits of the native growth of the black walnut (*Juglans nigra*) in this state are along the Cannon river, and thence southwesterly through Blue Earth county. At Miller's lake, Dahlgren, T. 115, R. 24, in Carver county, the black walnut was found when the country was first settled in 1855-6. It is doubtful whether the black walnut has ever been found elsewhere north of the Minnesota river growing wild.

These limits can by cultivation and planting northern grown seed, be extended northward very much. If the conditions which restrict its growth further northward are considered, it will be seen that it is not so much one of temperature, since the mercury, with very little difference, falls as much below zero on the Cannon river and through Blue Earth county as it does one or two hundred miles further north; but, that it is one of moisture, soil and cultivation and, as with the apple cultivation produces the conditions favorable for a profitable yield beyond the bounds made by nature, so also can we more reasonably expect that the black walnut, since it is already acclimated in the southern one-third of the state, will make a profitable growth probably to the northern boundary, except in localities where early and heavy frosts prevail. The experience of the last year or two has proved beyond a doubt that apples, grapes, plums and raspberries are by cultivation practically under control against the effects of drought. On the other hand, we must admit that cultivation alone will not give on the uplands of the state generally the conditions favorable to a profitable yield of strawberries and blackberries or among vegetables, celery. The walnuts grown in this state will produce trees better adapted to stand the winter climate and also the frequent droughts, while those from Illinois and further east are very liable to be injured by droughts and low temperature.

The soil most favorable for growing the walnut is a black loam, naturally moist, with clay subsoil. However, there are few soils, excepting the sandy, but where the walnut could be grown with cultivation; and for a paying product, a careful and continued cultivation must be given. Weeds and grass, with droughts, do not favor profitable yields of any crop or product, and the walnut will not be found to be an exception. The land for a walnut grove should be well plowed in the spring and planted with a hoed crop, and before planting in the fall the land should be well manured and plowed deeply. Two-year or three-year old trees can be set out in the spring, or the nuts can be planted about four inches deep where the grove is to grow the last of October or in November before the ground becomes frozen. This may be the better way, but the black walnut can be as safely replanted as other trees. The rows should be twenty feet apart, as this admits of four rows of potatoes or beans, or five rows of carrots, three feet apart, between each two rows of trees. The nuts intended for planting should be left in a dry place through October, so that they should be partly dried and planted

as before recommended; and if planted where they are to grow, some should be dropped by measure ten and twenty inches apart, and the rest two feet, if to be transplanted, one foot from each other. In this way the value of the vegetable crop will more than pay expenses, leaving the grove free of cost. At the end of ten or twelve years, the trees should be left in the rows twenty feet from each other. It might be advisable after ten years to stop cultivation, but the trees would do better for a longer one. Probably no tree does less injury to a crop growing near than the walnut.

One objection to the tree is that sometimes in August or September the limbs are broken or branches split from the tree by the winds. No tree, even the elm, has greater vitality than the walnut. Hard maples, growing on well cultivated land for ten years, were entirely killed by the drouth of 1894 and last winter, while the walnut was not injured in the least. Trees from nuts which grew in Putnam county, Indiana, planted in 1868 but not growing till 1869, were killed about seven years ago. These have sent up sprouts which produced walnuts this year. The trees now growing from walnuts produced by one of the trees growing in 1869 from Indiana nuts, are much the more hardy and thrifty. From one of these trees ten or twelve years old, three pecks of unhulled walnuts were gathered last fall. At ten feet from each other each way, 441 would grow on an acre; at twenty feet each way, 100. After eight or ten years, the trees would be of value for posts, and at that age each tree would be worth at least twenty-five to fifty cents, making the value of an acre twenty-five to fifty or one hundred dollars. The essential points in growing the tree are, the walnuts must be grown in Minnesota, their vitality not injured in any way, and a careful cultivation of the land. "Will it pay to grow the black walnut in Minnesota?" can be answered affirmatively by the grower if he will observe and follow the natural laws controlling its growth. The shell bark hickory can be recommended for trial in this state. It is found in Houston county. Trees also from nuts from Indiana, planted in 1869 and killed to the ground twelve or fifteen years ago, sent up shoots which have continued to grow since and came through the season of 1894 and 1895, while the Norway spruce, cultivated alongside since 1870, were mostly killed. The hickories grow in a very tough bluegrass sod.

Mr. M. C. Bunnell: Would you recommend cracking the nuts before planting?

Mr. Cummins: No, I would not. Plant them in the fall about three or four inches deep.

Mr. Clarence Wedge: Mr. Cummins advised drying those nuts, and it seems to me they ought to have some moisture. It seems to me they would not germinate the second year.

Pres. Underwood: What is the object of drying them?

Mr. C. F. Gardner (Iowa): I feel like making a few remarks on this subject. I will state that I have planted black walnuts for almost thirty years, and my experience has been that if those nuts are dried one particle the meats in them will shrivel,

and they will not grow, and my advice would be to take care of those nuts and keep them from drying, and keep them as nearly as possible as they were when you first picked them off from the tree. It will do no harm to dry them so the shuck on the outside is dry, but if the nuts dry I never have been able to grow them

Pres. Underwood: As I understand it, that is all Mr. Cummins is claiming. He is afraid the nuts will mould. They will sometimes mould if not dried in the shuck. He does not mean to dry the meat in the nut; drying the shuck is sufficient.

Mr. Wyman Elliot: I have had some experience in growing the black walnut in earlier days. My method was to gather the nuts and spread them on the ground, on a level piece of ground, and cover them about two inches deep; let them lie until December before planting, which would be just before the ground freezes up. Then I would just cover them over with soil, and I never had any trouble. Mr. Cummins says they are a tree that is easily transplanted. They are not after the first or second year planting. They run a tap root right down. The Minnesota black walnut is very much hardier than they are in Illinois, Indiana and Ohio. I have tried them from different sections, and I have found those grown in the Southern states a great deal more tender than our native walnut.

Mr. E. H. S. Dartt: I have had some experience with the black walnut. I can corroborate what Mr. Elliot has said in regard to the difficulty of transplanting after attaining a little size, but his last statement I will have to go back on. I have a tree, the nut of which was grown in Kansas, transplanted to Wisconsin and from there transplanted to Minnesota, and it is to-day the nicest tree in the lower section of the state, a foot or more in diameter and just as hardy as any black walnut I ever saw. That would seem to indicate that whether the nut was grown in Kansas or Wisconsin, it would make no difference in the hardness of the tree.

Mr. A. J. Philips (Wisconsin): I think it was acclimated in Wisconsin. (Laughter.)

Mr. Gardner: I wish to state that if you wish to transplant black walnut trees, when you set them out, no matter whether they are one year of age or more, just as soon as you plant them out saw off the tops close to the ground, and I think you will have success. I always cut the top off, and if the tree is two or three years old, I get a straight shoot the first year, and get a straight tree four feet high. If you leave the top on, it makes

a slow growth, and it will not be nearly as large in five years as if you had cut the top off.

Mr. J. O. Barrett: I understand Mr. Elliot to speak of the tap root. In the old country they make a pavement, either of cement or plank, and carry on dirt, say six inches, and then plant the seeds in that, and the roots are from necessity obliged to spread out horizontally, so there is no difficulty in avoiding that feature. That reminds me of what the Secretary of Agriculture at Washington wrote to Prof. Northrup(?), of Cornell, who reported it to me, and it will be published in the next edition of my manual. He said, Mr. Morton, the secretary, was in the habit of plucking his walnuts while green and planting them instantly without delay, and in his letter to Mr. Northrop he stated it was a triumphant success. The kernel inside was not dry, and the ground kept the seed in proper condition so that it sprouted very readily.

Mr. O. M. Lord: I planted a good many walnuts for several years and found no difficulty in making them grow. Probably the best way and easiest way, the cheapest and quickest way, is to pick them up as soon as they fall, then with a plow turn a furrow over, string them through the furrow and cover them with the plow, and they will all come up. Sometimes they will not come up until the second year. I have met with just as good success by gathering them and digging a hole in the ground and planting them, or throwing them on the ground where we are plowing, and plowing them in.

Mr. Barrett: How deep do you plow them under?

Mr. Lord: Don't try to turn the furrow more than two inches over them. I have never tried transplanting very large trees, but people have come to my place and taken them away four and five years old, but I have always insisted that they should dig them and plant them immediately to protect them from the wind and sun. You will find several of them in Winona making fine shade trees. For my own transplanting, I prefer to transplant them when they are a year old.

Mr. Dartt: Are your black walnuts all doing well?

Mr. Lord: Yes, sir; I have trees eight years old that have borne this last season more than a bushel of walnuts, and have borne for three years more or less.

Mr. Philips: I do not know whether it would be a good idea to put a plank under or not. I had a friend at La Crosse who wanted a butternut tree. He said he understood he must have all the tap root, and he had a place where he wanted to grow

one, so he hired two men to get him a nice tree, and he told them to be very careful to get all the tap root. He came home at noon, and asked his wife if the men had come home yet with the tree. She said no, they had not. "Well," he said, "I guess I will have to get some one else." He came home at night and saw a couple of men digging a well. He said to them, "What are you doing?" "We are digging a hole for your tree." The tree was fifteen feet long. The tree above ground was seven feet, and the tap root was eight feet long. The men said, "You told us to get it all, and we did." That tree grew. (Laughter).

Mr. Dartt: From the experience I have had with the black walnut in Steele county, a man need not flatter himself on the fortune he is going to make growing black walnuts in Minnesota.

Mr. C. L. Smith: If Mr. Dartt does not succeed in growing black walnuts, I don't know that I would recommend any one to do it, but judging from what I saw on Mr. Lord's place I should think it was a very fine industry. They grow well on the prairie. I have found them in a great many different places. I think Mr. Lord's method of planting is the most economical, and I would certainly recommend the planting of the tree where it is to grow. I have had considerable experience in regard to transplanting, and I prefer to cut off the tap root eight to ten inches below the ground. In the spring when they are a year old, just cut off the tap root and cut off the top and let them come up, and the next year they will have some side roots, and they can be very easily transplanted—or they can be transplanted two years afterwards. They can be transplanted at the end of three years, but you want to cut off the tap root again, the same as in the beginning, as they throw out tap roots again.

Mr. Lord: Not so directly, but more or less.

Mr. Smith: I had a little experience in getting black walnuts from the South, and it will hardly agree with what Mr. Dartt has said. I had some call for black walnuts, and sold more than I could spare, so I sent to Rockford, Illinois, and got five bushels. I sold four bushels and had one bushel left. Afterwards I got three bushels from a neighbor of Mr. Kenney's, and I planted the lot in two rows. I planted the one bushel from Rockford as far as they went continuously and finished with the other lot, and the last row was all in black walnuts grown in Rice county. The first winter every tree

from the Illinois walnuts killed down to within six inches of the ground, and some of the Minnesota killed back one or two inches. After three or four years I could see no particular difference between the trees from Illinois seed and the Minnesota seed, but the first year those from Illinois killed back the worst. I have never known the black walnut to winter-kill in Minnesota, no matter where the seed came from. They may freeze down the first winter one-half or two-thirds of the growth, but they will come up again. I can heartily indorse what Mr. Gardner says: "Saw the tree off at the ground when you do the planting, and it will make a tree three or four feet high the first year; and you take another of the same size which you do not saw off, and at the end of four years you will have a great deal larger and better tree from the one you sawed off."

Mr. A. F. Collman (Iowa): I have quite a large grove on my place—some trees that I bought when quite young and transplanted them. On another place I have several trees. I saved the walnuts in the fall, plowed the ground very nicely, planted them four feet apart each way and stepped on each hill with my heel. Two years after I transplanted the trees, and those trees that were grown from the nuts are larger than those that were transplanted, and they are the best trees.

Mr. Wedge: What is the commercial value of the nut?

Mr. Elliot: About one dollar a bushel.

Mr. Harris: In Mr. Cummins' paper he mentioned hickory nuts. In a little corner of Minnesota they can be grown so they will be of more commercial value than the apple. I have a tree that has been bearing for thirty-five years, and that tree every alternate year bears more nuts than three families can use. A great many nut trees have come up on my place, and wherever those have commenced bearing I find the nut is larger and finer than those from the old trees that used to be there. At the time I planted my young orchard, I had to cut down some two hundred nut trees. I believe I could have made two dollars out of the nuts where I can make one dollar out of the apples, but it is apples the horticultural society is looking for now and not nuts. I think we can extend the region much further north than nature would indicate they would grow. It is perhaps some other cause than the climate that causes them not to do so well. Any time any members want some nuts, I will send them a small package.

ABOUT THE NAMING OF NEW FRUITS.

HON. H. E. VAN DEMAN, PARKSLEY, VA.

One thing I notice is needed in Minnesota as well as in other parts of our country, that the originators and introducers of new fruits use more judgment in naming them.

The list of cultivated varieties has long since become so large and cumbersome that a reformation has been and now is a necessity. The matter has been forcibly presented over and over by some of the best pomologists of the country, and yet the addition of new names of unwise and confusing character goes on. The originators or introducers of new fruits often do not know of the impropriety of the names they adopt, and I sometimes fear that they do not care. It might be well for the editor to publish the rules of nomenclature of the American Pomological Society for the guidance of the readers.

The names should be as simple, short and smooth sounding as possible. The name of a river, mountain, county, town or of a person is often all right, but there is a great danger of duplicating those already in use. Do not use Prolific, Beauty, Red, White, Greening, Pearmain, Pippin, Seedling or any other name that is so common. Denote seedlings by numbers at home or while under trial in the hands of experimenters, but never send them out to the public under such titles.

There are two national authorities on pomological nomenclature, the American Pomological Society and the Division of Pomology at Washington; or perhaps I should say one, for they now act in unison, as I had originally hoped and planned when I conceived of and organized that division in 1886. If those who have new fruits to name will address the latter, they will be greatly helped in finding out from the only list in existence—and made for that purpose in part—whether the name conflicts with any other in use and also in other ways.

RULES FOR NAMING AND DESCRIBING FRUITS.*Adopted by the American Pomological Society.*

Rule 1.—The originator or introducer (in the order named) has the prior right to bestow a name upon a new or unnamed fruit.

Rule 2.—The society reserves the right, in case of a long, inappropriate or otherwise objectionable name, to shorten, modify or wholly change the same when they shall occur in its discussions or reports; and also recommend such changes for general adoption.

Rule 3.—The name of a fruit should preferably express, as far as practicable, by a single word, a characteristic of the variety, the name of the originator or the place of its origin. Under no ordinary circumstances should more than a single word be employed.

Rule 4.—Should the question of priority arise between different names for the same variety of fruit, other circumstances being equal, the name first publicly bestowed will be given precedence.

Rule 5.—To entitle a new fruit to the award or commendation of the society, it must possess (at least for the locality for which it is recommended) some valuable or desirable quality or combination of qualities in a higher degree than any previously known variety of its class and season.

Rule 6.—A variety of fruit having been once exhibited, examined, and reported upon as a new fruit by a committee of the society, will not thereafter be recognized as such so far as subsequent reports are concerned.

A rule governing the revision of names, as authorized by the society at the meeting in Washington in September, 1891, is as follows:

Prefixes, suffixes, apostrophic terminations and secondary words, together with words whose significations are expressed in the descriptive columns of the catalogue, are eliminated from the names of fruits, save in a few cases in which they may be needful to insure the identity of a variety and in a few time-honored names.

The anglicising of foreign names is resorted to only in the interest of brevity or pronounceability.

In questionable cases, subsidiary words are retained in parentheses.

November Calendar.

J. S. HARRIS.

The calendar for November, published in the report of 1895 is doubtless accessible to all of our members, and it is needless to add very much to it except as reminder.

The work in the orchard is, first, to see that the fences and gates are in perfect repair, and that the gates cannot be carelessly left open to admit stock. Some kinds of pruning can safely be done in autumn, but browsing by stock and horn pruning has never yet proved a satisfactory success. Remove dead and broken limbs, also

..... hted twigs below where they are affected and burn read of the disease, and if any trees are so badly y will not likely recover they had best be removed to make room for something better. All wounds pruning ought to be covered with pure white lead varnish.

asteppring and others not large and well established, rth banked up about the base, making a conical e foot in diameter and eight to twelve inches high. ean, solid earth, free from sods and weeds, or it will home for mice. The mound thus made serves the of a support to the tree against the winds of winter, ce from gnawing the bark from the trunks. This leveled in the spring. Before placing this mound e a careful search for borers, and if any are found, probe their borrow with a wire to destroy them. lso beneficial to apply a coat of lime whitewash l larger branches, to which a half ounce of carbolic ound of copperas is added to each two gallons of

d do work much harm in the young orchard by k from the trees, and here they often begin their ite early in the fall. The most effectual and, in the feguard is to fence them out and keep the gates best done with chicken wire screen fencing, thirty feet wide, with two inch meshes. This is tightly apled to posts set about sixteen feet apart, the lower e to the ground. Above this are put two or more make the fence secure against stock, and Mr. Dartt, . station, has discovered that by suspending another e and clear of the tops of the posts, it being fastened

to cleats about midway between the posts, it makes a fence that will keep out boys and fruit thieves. Where there are but few trees to be protected, it may be done by winding them with cloth bands, hay or straw ropes, or fastening about them cornstalks or strips of lath. Sometimes smearing the trunks with blood or rubbing them with fresh meat will answer the purpose, but it is not liable to last through the whole winter. Other devices are, placing shallow boxes containing a mixture of corn and oats near their runways, and when they are once baited, trap them, or watch and shoot them on bright moonlight evenings.

Every "up to date" orchardist will have a chart of the grounds with each tree and its kind recorded. This is a good time to make such a chart. It is not safe to trust to the labels that come with the trees from the nursery. The labels get loose and are lost, or the names soon become obliterated; and when the name of a variety is unknown, half the interest in its welfare is lost.

Scions for root-grafting in the winter and top-grafting next spring may be cut as soon as the leaves have fallen or any time before the severest winter sets in and when not frozen, packed in sand or fresh sawdust and put into a cool cellar, and they will keep fresh until needed. Care should be taken in selecting the scions, cutting them only from thrifty and healthy trees.

Blackberries and raspberries that are to be protected during the winter may now be safely laid down and covered with earth or other material. Grape vines should be pruned as soon as possible after the leaves fall and put in position for later covering. Rather early pruning is usually the best.

It is an excellent plan to mulch between the rows of the strawberry beds at this time, or a little earlier, but not to cover the plants in the rows until winter is about to set in.

ARE WE KILLING OUR BIRDS?—Who has not noticed the disappearance of the little birds from our fields and berry bushes since the deadly Bordeaux and other similar mixtures have become so universally used. Surely our little friends are leaving us, and not only they but many of our insect friends that daily feast on the insects that destroy the products of our labor. The diligent and untiring search of these little birds in the trees set me to thinking whether or not we were not poisoning more of our friends than enemies. Sure it is that there is a rapid increase of noxious insects, and the time is already here when the chances of a paying crop hang very largely on the thoroughness with which we spread the deadly poison over the foliage of trees, vines, bushes and plants. Nothing escapes; everything has its enemies. It cannot be denied that the precious little songsters that so delight us are eating the poisoned insects and picking it up on foliage and bark and are rapidly sent "where the good birdies go," and we turn longingly to the chemists and enquire if something cannot be produced that will kill the insects and spare our feathered friends.—*Mo. Hort. Soc. Rep. 1895.*

Your Corner.

"I have three varieties of apples, three of plums and two of pears which I imported from Denmark. The trees are doing well but have not fruited yet; I think some of them will fruit next season.

Rose Creek, Minn., Oct. 19th, 1896.

JENS A. JENSEN."

"My success this year with berries was phenomenal. My Early Thompson raspberries gave me a return of \$1,500 per acre. I am fully aware this enormous yield will be doubted by many, even old fruit growers, yet it is substantially correct.

Blanchard, N. D., Oct. 25, 1896.

THOS. HARRISON."

"From what I have seen, I may say that this year was very favorable for apple growing in Collegeville and neighboring towns of Stearns county. I know four or five farmers in our vicinity whose trees were loaded with fine, beautiful apples, especially Duchess and Wealthy. Crabs also were doing well. Mr. Math. Reisinger, of Collegeville, has a little Wealthy, only four inches in diameter, which bore five bushels of apples.

REV. JOHN B. KATZNER."

Collegeville, Minn., Oct. 16th, 1896.

"With me the Early Washington, or Sops of Wine, is a more profitable apple than the Tetofsky, but can't say that the tree is as hardy, and there are very few trees in this state as far as I can learn. But its flavor, together with its rich, red color, sells it anywhere.

"In regard to strawberries, will say that the Bederwood is a good fertilizer, but have found it the most subject to leaf rust and fungous diseases of all the varieties I have tried.

Dresbach, Minn., Oct. 17th, 1896.

W. S. WIDMOYER."

THE FIRST NURSERY.—"My Dear Latham—In your October number I noticed a mistake that ought to be corrected while many pioneers are still alive to verify the truth of history. It is well known to all the old settlers that my nursery was started between St. Paul and St. Anthony long before there was a Minneapolis or Fillmore county. In the obituary of Mr. Barnett Taylor, it is said he started the first nursery in Minnesota, although he did not settle in the state until 1857, while I came in 1850, and some apple seeds were planted in the fall of that year. From that small beginning sprung the "Groveland Garden and Nursery," which was known all over this country and in Europe until 1885, when I rented my greenhouses and nursery, on account of poor health, and came to this country, where I started "Ford's Tropical Nursery." Many evergreens, I learn, are still growing about the old place, which is now a little suburb of Merriam Park, on the Milwaukee road.

San Diego, California, Oct. 12th, 1896.

L. M. FORD."

Secretary's Corner.

SET UP YOUR OWN FRUIT.—Considerable fruit has been stored for the exhibit at our annual meeting, and we may expect an even better display than last year.

DESCRIPTIONS OF SEEDLING FRUITS.—Do not forget to bring or send full descriptions of any promising seedling fruits, especially apples, to the annual meeting of our society, which meets in Minneapolis, December 1, 1896.

DON'T MISS THE ANNTAL MEETING.—Our meetings are always very profitable, and we intend this shall be especially so. Especial attention will be paid at this session to the subject of "Strawberries" and "Apples," and a large number of short papers presented on each subject.

THE TREE CRICKET OR THE CURRANT BORER.—If any of our readers have been in any measure successful in combating these destructive insects, that are doing so much injury in many localities, will they please *send* their experience *at once* to the secretary? We need all the information obtainable on this very practical subject.

ARE YOU IRRIGATING?—If you have done any irrigating this year or last, on either a large or small scale, or experimented in that direction, will you please set down *now* and write a concise account of your experience and send to the secretary, so it may be at hand before the annual meeting, December 1st. Information on this subject is *especially* needed.

NO WORLD'S FAIR MEDALS YET!—A letter just received from Hon. D. A. Montfort, of St. Paul, late president of the Minnesota World's Fair Commission, says that he has "Had no information whatever with reference to any (medals) which were awarded either on account of the fruit exhibit or to individuals,"—and these awards were made over three years ago. Comment is unnecessary.

OUR ANNUAL MEETING.—The annual meeting of this society will convene in Minneapolis, December 1st, next and continue in session three days. The meeting will be held in the offices of the county commissioners in the court-house, same place as last year. The usual reduced rates have been secured. The program is in preparation and will be sent by November 15th to the members and all others applying to the secretary.

SHALL YOU BUY ANY NURSERY STOCK THIS YEAR?—Remember there are plenty of reliable nurserymen in the Northwest, and you are safer to place your orders near home where you know something of those you are buying of. Any cases of unfair dealing on the part of tree agents, it would be wise to report to this office. The unprincipal tree "shark" is a nuisance that needs abating badly in this part of the world; but this must not be construed as a warning against placing orders with agents of nurseries which you know to be reliable. Nursery stock must necessarily be largely sold

through agents in a new country like this, where local nurseries are so scarce.

STRAWBERRIES BY THE BARREL.—A novel method of growing strawberries is suggested, which is adapted to gardens of very limited area. Take a barrel and bore inch holes through the side eight inches apart and in rows four inches apart, alternating in the rows. The plan is to set a strawberry plant in each hole, roots inside, of course. The process of planting is to fill the barrel with earth level with the lowest row of holes, then put in this row of plants and fill with earth to the next row, etc. A tiling, say of three inches in diameter, is put in the center of the barrel from near the bottom to above the top, and into this is poured water and liquid manure for irrigation and fertilizing. Such a barrel would require about one hundred and thirty-five plants, and it is said it has produced as high as five bushels of berries. If anyone is interested enough in oddities to try it, the readers of the *Horticulturist* would like to know the results.

OUR STATE FAIR FRONTISPIECE.—The view shown at the head of this number is, probably, the most comprehensive one of Horticultural Hall that has ever been printed. The artist stood in the gallery at the west end of the hall, and the camera was located some twelve feet above the floor of the hall. It shows fairly well the three tables in the center on which the fruits are displayed, and on either hand against the wall the tiers of shelves containing the florists' exhibits. At the left hand side, just beyond the show of plants, appears the exhibit of 175 plates of Russian apples made by the Iowa Experiment Station. The county agricultural exhibits at the farther end of the hall are obscured very completely by the fountain in the center, surrounded by the florists' display of decorative plants.

A TROPICAL NURSERY.—Our old friend and fellow member, L. M. Ford, for so many years proprietor of a nursery and greenhouse in what is now Merriam Park (between the Twin Cities) has returned again to his first love, and is conducting in San Diego, California, what he terms a "Tropical Nursery." Some of the specimens of his products came to the writer in an exaggerated cigar box lately and proved on disclosure to be a very fierce and aggressive looking collection of cacti. A slip at the top of the box said "handle these with a darning needle," and we saw the point. A lady friend visiting us from Southern California said "the horrid things," but then we had seen her home when they were trying to get rid of cacti to plant vines, and so understood her antipathy. We have no fear that they will take possession of our garden and drive us from the premises, and so we shall try and coax them into budding out in the wonderful manner which is the fashion with this very curious and interesting family. About thirty of us walked a considerable distance at 11 p. m., lately to see a cactus in bloom, which it was said would not flower again in a hundred years. Such a vividly beautiful flower, exaggerated by the homeliness of the plant that bore it and the hour at which it must be seen! Few of us may live to see it flower again—but perhaps Mr. Ford has sent some that will blossom with less reluctance.

**A. C. TUTTLE, BARABOO, WIS.,
and
A LONGFIELD APPLE TREE, FOUR YEARS OLD.**

THE MINNESOTA HORTICULTURIST.

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A LONGFIELD APPLE TREE AND ITS PLANTER, A. F. TUTTLE, BARABOO, WIS.

J. S. HARRIS, LA CRESCENT.

The subject of our frontispiece this month is a Longfield apple tree in the fourth year after planting in the orchard. Of course, it was not such a tree as travelling tree venders usually furnish our farmers, but was honestly grown and skillfully dug in the nursery and replanted in his orchard by the veteran and oldest horticulturist now living in his state, A. G. Tuttle, of Baraboo, Wisconsin, whose portrait is seen in the foreground.

Mr. A. G. Tuttle was born at Litchfield, Conn., in 1815; consequently, is now past eighty-one years of age. He came to Madison, Wis., in 1846, to Portage City in 1847 and to Baraboo in 1848. He was engaged in the mercantile business about five years, but abandoned it on account of failing health, and began orcharding in 1853. His first plantings were necessarily largely of untried varieties, and he early realized that the great majority of the then existing American varieties were not adapted to this climate, and secured through Hon. Cassius M. Clay, then consul to Russia, an importation of scions of a considerable number of Russian varieties of the apple in 1866 and again in 1868. He has planted these varieties extensively in orchard for testing and found many of them entirely hardy with him and producers of good fruit. At the late Wisconsin state fair, he had on exhibition seventy-five varieties that for size, beauty of appearance and quality, were equal to any like number of our most popular American varieties. His favorite for a general purpose apple is the Longfield.

The Longfield apple is rapidly coming to the front as being about the most valuable of all the varieties imported from Russia, and is equal in most respects to the best of our American varieties, when well-grown.

Description of the fruit: Size, four to five, or full medium; weight, four and a half to five ounces; form, smooth, round ovate; color greenish-yellow in the shade and clear, deep blush on the sun side; stalk, medium long, elastic, and set in a small, narrow cavity, showing a little russet at the bottom; calyx, closed, in a medium, deep wrinkled basin; flesh, white, fine grained, tender and juicy; flavor,

pleasant sub-acid, good; season, October to December; use, all purposes; origin, Russia.

The tree is a medium strong grower in the orchard, commences to bear when very young and is inclined to bear very heavily; and probably one acre of them well cared for will produce forty barrels in the sixth year from planting, and thereafter more fruit per year according to age than any other variety known. The tree is believed to be healthier and longer lived than the Wealthy, and to be equally as hardy.

TREE GROWING ON THE COTEAUX OF SOUTHWESTERN MINNESOTA.

F. F. PRATT, CAMDEN.

(Mr. Pratt is at present connected with the Experiment Station at Crookston.)

The Coteau Experiment Station is situated in the southwestern part of this state, in Lyon county, on the farm of Mr. O. C. Gregg, our worthy superintendent of Farmers' Institutes.

The farm gets its name "coteau" from a range of hills which extends across this portion of the country. The country adjoining those hills is rather high and rolling, especially in the western part of Lyon county. The average altitude of Lyon county, as given by Twitchel, is about 1,200 feet, and at this farm it is 1,500, having the highest altitude of any of our prairie counties, I believe, except Yellow Medicine, which joins it on the north and west.

The soil is a rich black loam, being from a few inches to eighteen inches thick on the prairie. The subsoil is a whitish clay which is very compact. This country for the most part is prairie, excepting the borders of the Redwood river and other small streams and lakes, or, rather, where lakes once were, where there are quite a variety of trees and shrubs found growing, showing that both climate and soil are suitable for them.

If there is one thing more than another that this country is noted for, it is its heavy winds and the frequency with which they occur. The prevailing winds are from the southwest and the northwest, and it seems as though this country is their battle ground. These winds are partly due to the altitude of the country. G. E. Curtiss, an employe of the U. S. Weather Bureau, has made a study of the hot winds of this region and speaks of them as follows: "In rare cases hot winds may scorch and burn vegetation while there is still moisture in the soil. It is especially apt to injure wheat when it is in the milk and also corn when it is beginning to tassel or ear; but, in general, hot winds do not affect the crops until by evaporation they have drained the moisture from the soil."

The causes of hot winds as noted by Mr. Curtiss are as follows: "The necessary condition is a diminishing pressure to the northward, producing southerly winds, which elevate the temperature above the normal. A cloudless sky favors an intense insolation, as a result of which the dry ground is soon raised to an extreme temperature, and the air is heated from it by radiation, reflection and conduction. The diminution of the density, due to the rising tem-

perature, is added to previously existing horizontal currents, and by ten o'clock in the morning the hot winds are fully developed. Hundreds of miles of hot, dry earth contribute to maintain and feed the currents, which gather strength as the sun mounts higher. The hot winds sweep over the defenseless prairies; neither hill nor forest rises in its path to break its power or dispute its sway, and with no enemy save the tardy rain cloud the heated blasts suck out the life sap of the growing crops."

Curtiss says also that the soil is heated to the high temperature necessary to the development of hot winds only when the ground is dry. The sun's heat falling upon moist soil is largely used in the work of evaporation.

I don't believe that the small area that the farmers are able to plant to trees on their farms will have any appreciable effect on the climatic conditions of this country in the way of increasing the rainfall, but believe it will be a great help in furnishing protection to man and beast from wind and storm, will stay the winds and stop evaporation to a greater or lesser degree and will keep the soil from drifting and hold the snow where it falls, and also furnish a home for birds, which help to keep the insects in check.

The necessity for planting trees and windbreaks in this country can readily be seen by all, but can be appreciated only by those who have been furnished protection by them. There is no place in all our state where horticultural work needs to be so much encouraged as upon our farms of the prairie.

The essential things necessary for plant growth are soil, sun, air and moisture. The three first we have here in abundance, and the last, water, is here in large enough quantities, as a rule, for the growth of all ordinary plants, if we would only learn to store it up for future use, which we believe can be accomplished to a greater or lesser degree by the proper preparation of the soil and by shallow, level and frequent cultivation. It has been said that knowledge is the keynote to success, and to no occupation will this saying apply better than to horticultural work. The grower of trees and plants must understand the nature of the soil and plants that he has to deal with, to have the best success. Especially is this true of our dry, windy prairies, where the rainfall is light.

Before starting to set out a forestry or a fruit garden, there are three things that a farmer should study upon:

First. He should try to find out which plants will stand the drought, heat and winds the best.

Second. He should know how best to prepare his land and to cultivate it so as to make it retain longest the moisture that falls upon it.

Third. He should know where and when to procure his trees and plants and how to take care of them after he gets them.

These are very important questions, which I will not attempt to answer in full but will say that we are trying to solve some of these questions at our experiment stations. I would be glad to hear them discussed somewhat by your society.

I will review some of the work that has been done here during the last two seasons under the supervision of Prof. S. B. Green, and discuss the methods of tillage that we have put into practice here.

In the spring of 1894, Mr. Hoverstad had charge at this place, and under the direction of Prof. Green set a few plum, apple and cherry trees and also quite a number of ornamental and flowering shrubs. Mr. Hoverstad had very good success, considering the dry summer of 1894, nearly all of the stock living and coming out all right last spring.

He also set out quite a number of willow cuttings of different varieties, most of which lived and made a small growth, but killed back during the winter and started up again from the roots this spring. Some of them made a growth of several feet during the past summer, the Golden, White and Laurel Leaf taking the lead in growth. Mr. Hoverstad's success was undoubtedly due to having good stock to begin with and to the thorough care and cultivation that he gave it.

In the spring of 1895, Prof. Green made preparations to set out here a forestry containing about four acres. The place selected was sheltered on the south and west by a willow hedge. The trees were to be planted in rows eight feet apart and to be two feet apart in the row. Young trees were used mostly, being from two to five years old. The trees were to be planted in plots containing about one hundred and seventy-five trees each and to be made up of a mixture of different varieties, to test the effect on different trees in furnishing protection for one another. There were some forty different kinds of trees and cuttings set out in all.

The land was prepared as follows: There had been a crop of wheat on it the previous year, and it was plowed in the spring four and a half inches deep; a subsoil plow followed the other plow running at a depth of six and a half inches, thus stirring the soil to a depth of eleven or twelve inches; after the land was plowed, it was harrowed thoroughly. The rows where the trees were to be planted were furrowed out with a plow, and two men followed, digging the trench made by the plow deeper and wider where it was necessary to make room for the roots of the trees to be planted, great care being taken to spread the roots out and pack the earth firmly around them.

Soon after the trees were planted they were cultivated with a six-shovel Planet Junior cultivator, and as there was a shower soon after this we cultivated them again with Breed's Weeder, lapping half and going right over the tops of the trees. This broke up the crust of the soil made by the rain, thus making a dust blanket on the surface of the land and leaving it level and also destroying all the young weeds.

About a week after this, we planted our experimental potatoes between the rows. The trench to plant the potatoes in was made by furrowing out with a plow, and the potatoes were covered four and one-half inches deep by hand with a hoe. The forestry and potatoes were cultivated soon after this with the Planet Junior cultiva-

tor, and just as the potatoes were coming through the ground it was gone over again with the Breed's Weeder. Every week or ten days after this, they were cultivated with a harrow-toothed Iron Age cultivator. The effect of this thorough cultivation could be seen on the potatoes as well as on the forestry, some of them yielding at the rate of five hundred bushels per acre. This fall (1895) we turned a furrow towards the tree on each side to furnish more protection to the roots for the winter, plowing very shallow so as not to disturb the roots of the trees.

A few of the reasons why we believe that sub-soiling and shallow level and frequent cultivation are the proper methods of tilling the soil of southwestern Minnesota:

Hellsiegel has proven by experiments that a comparatively loose soil is capable of holding forty per cent of water, while a compact soil will hold only twenty-six per cent of water. Now, on a great many of our prairie farms, we have a firmly compact sub-soil, with quite a firm surface soil, especially directly under the furrow slice, this part being made firmer each year by the tramping of the horses' feet and by the pressing of the plow. I believe that the soil is too firm to hold as much moisture as it would if it were looser, and therefore believe that subsoiling once in, say, three or four years would be quite a help in making it loose so that the water that falls upon it would penetrate it more readily; consequently, there would not be so much evaporation, and the roots of plants would also penetrate it much easier. I also believe that the power known as capillary attraction would be freer in its action. (Subsoiling may not have much effect on some crops the first season, for it might be that it would leave the soil too loose, especially if there were not many rains to settle it together before the growing season). Shallow, level and frequent cultivation keeps a dust blanket on the surface of the soil, which prevents the moisture from evaporating.

By level cultivation we keep less soil from being exposed to the wind and air, and by so doing keep considerable moisture from evaporating.

A few of the trees that are found growing along the streams and lakes here and a few of them that seem to be doing well on the prairie, are the following: box elder, white ash, red and white elm, water elm, black cherry, white birch, cottonwood, several varieties of poplars and several varieties of willows.

A record of the moisture precipitation in inches for the years of 1893, 1894 and 1895, as given by the Weather Bureau Station, Camden, Minn.:

	1893.	1894.	1895.
April.....	6.96	3.95	2.45
May.....	3.48	1.31	3.47
June.....	2.65	1.68	2.70
July.....	lost	1.39	2.74
August.....	1.38	1.40	3.06
September.....	1.15	3.08	3.80
	<hr/> 15.62	<hr/> 12.81	<hr/> 18.22

APICULTURE.

JOHN TURNBULL, LA CRESCENT.

There has been so much said on this subject by our professors and others, yet with all that has been said and written on apiculture there still remains doubts in the minds of many in regard to the pollenization of flowers.

When I moved onto my farm twenty-seven years ago, there were no bees in our neighborhood. I had a very nice orchard to begin with, and this seemed to take my attention more than any other thing on the farm. When the apple and plum trees were in full bloom, it gave a new charm to the farm, and I told my family we would have lots of fruit, especially plums. A farmer from another part of our valley came to see us, and the first thing I had to show him was my beautiful orchard. I said "Look there; won't we have lots of plums?"

He laughed, and said "No."

I looked at him, and said "Why?"

"Well," said he, "Those plum trees were taken from my farm; they never had any plums, neither had mine, except some little bits of things that never matured."

This took me down considerably, for this was my first attempt at farming. Well, it turned out as he had said; no plums, though I had a few apples.

The next spring I was visiting some friends in Wisconsin, and I bought a swarm of bees, and set them in my orchard, and when my apple and plum trees blossomed out again, and the bees commenced their sweet music, there was charm No. 2. But what was my surprise when I watched the falling blossoms to see the little pellets holding on to the mother tree and growing larger and larger all the time, till fine, large, ripe plums hung from every branch. The few old trees that are left give us a few plums every year. This started a new problem for me to work out. I might speak of others, but this will suffice for the present.

This spring (1895) opened up very favorably. Everything seemed to be full of promise for a large crop of fruit, especially apples. Many of my seedlings were full of blossoms, and the bees were in full force and did their part well. But, alas, how little we know of the future.

On the 11th of May we started for La Crosse in the morning and had to take off coat and vest, it was so warm, and before we got half way we wished for an overcoat and had to borrow one to wear home. From that night to the 22nd, it froze every night, and took every apple—did not have one in the orchard. Plums were a fair crop; raspberries and blackberries good; strawberries were poor; grapes, the first bloom being killed, bloomed a second time and matured most of them.

The bees came out of winter quarters in good condition, and the weather in April was exceedingly favorable for them. On the 10th of April they were coming in loaded with pollen, and bred up fast, and were in good order and ready for white clover, but there was very little white clover to work on. The dry summer of '94 and close

pasturing worked injury to nectar secretion. As it reduces the foliage, so also the rootlets suffer, as nature strives to sustain a just proportion between leaves and root expansion, causing scattered nectaries in the blossoms or only partial development. So our crop of white clover honey was very poor. Basswood honey was a failure altogether with us, and fall honey was a poor crop, too. There was a time when we could rely on a fall crop of honey, but we have given up hopes of former yields on account of the consequent increased population and the turning over of grazing lands for cultivated crops. Then, the loss in wintering has reduced the bees in Minnesota one-half or more, so bee-keeping has not been a paying business, and many have given it up altogether. Upon the whole, the outlook is not very encouraging.

Now, it is a fact that horticulturists and farmers are dependent upon bees for good crops of fruit and clover seed, which a few facts from men of experience will show.

The more progressive of market gardeners realize that they cannot get perfect results without bees.

Where imperfect fertilization has taken place, fruit is not completely developed in size and form, so that the quantity and quality are affected. From observations made, it is claimed that orchards with bee-hives in them have been more fruitful than those without hives.

Prof. A. J. Cook in his experiments says: "Thus we see that in all our fruits, in strawberries the least, the free visit of insects during the period of blooming is absolutely essential to a full or even a fair crop."

His experiments with clovers, white and alsike, was that, while the uncovered heads were full of seeds, the covered ones were entirely seedless. Then he winds up with these words: "Thus we see that our horticulturists and farmers, alike with apiarists, are dependent for the best prosperity on the presence and well being of the bees; they should realize this fact and demand that legislators not only become informed, but act accordingly."

Now, in conclusion, let me ask that every member of this society do his best and try and persuade farmers to seed with alsike in place of red clover.

SMALL COST OF SPRAYING.—During last year the Delaware Experiment Station made some exhausting tests as to the cost of spraying trees. In using the Bordeaux mixture, they sprayed the trees six times, and reckoned in the cost of materials and cost of labor and found it to be two cents per tree per spraying, or twelve cents per tree for the season. The result was that the rot was reduced to one-third what it was on the unsprayed trees. They found, also, that four sprayings gave about the same results as six sprayings, and that there was about twice as much rot with two spraying as with four or six. So we see that four sprayings, or eight cents per tree is all that it really costs.—New York Farmer.

SEC'Y ELMER REEVES.

WAVERLY, IA.

Mr. Elmer Reeves, whose portrait accompanies this sketch, is now, and has been since 1888, the secretary of the Northeastern Iowa Horticultural Society, and was one of the original organizers of that society in 1885.

He is both by inheritance and training a practical horticulturist, his father having preceded him as a nurseryman and orchardist, so that in his earliest years he had instilled into him a love for and knowledge of this art. In 1884 he began cultivating a nursery for himself at Waverly, Iowa, where he still lives. Previous to that he had received a suitable training under Prof. J. L. Budd, at the Iowa Agricultural College, and afterwards with that

veteran nurseryman of northern Iowa, Mr. Charles G. Patton, who is so well known to us all.

Mr. Reeves is one of the younger 'race' of Iowa horticulturists, being now 37 years of age, and we anticipate will do as much for the horticulture of the Northwest as his vigorous youth and opportunities give promise of.

LATE BEARING TREES.—H. M. Stringfellow, of Galveston, Texas, writing of his experiences in this line, in the Rural New Yorker, says:

"A long experience has convinced me that no fruit trees should be propagated from young trees that have never borne. If continued long, it results in barren trees long after they should begin to fruit. In my own LeConte pear orchard, trees propagated from bearing ones fruited full the fifth year, while those grown from cuttings taken from young trees that had been grown several generations from young trees, never bore at all until nine, and bore full only the tenth year. I have had oranges, propagated from bearing trees, fruit full the third year, while those from young trees took seven and eight years. I never noticed in the end, however, any difference in productiveness. Continuous propagation from young nursery trees is a great injustice to the fruit grower."

PLUMS AND CHERRIES.

DEWAIN COOK, WINDOM.

The season of 1895 was rather unfavorable to both the plum and the cherry. The blooming season was about three weeks earlier than usual, while we had the May frosts at their usual season. Wild plums were scarce. My Desota, Wolf and Speer trees bore their usual heavy crop. I also have nearly fifty Desota and Wolf, set eight years, that bore almost nothing. They were grafted on Marianna stock. With the exception of three or four trees I overlooked, I cut down all of the Russian plum trees last spring; they were on the decline from winter-killing and were unfruitful. The Milton plum is decidedly tender; we cannot even raise the trees here. Mr. Jno. Wood, of this place, has a very good wild plum that is some two weeks earlier than the Cheney. He calls it the Early Minnesota. A sprout of the Mankato plum, sent me by Mr. S. D. Richardson four years ago, bore this season. The fruit, in appearance, resembles the Forest Garden, but is a little larger, earlier and of much better quality, and is a better tree. It promises to be a valuable addition to our list of plums. The Rockford seems to be a shy bearer, and the fruit is much injured by the curculio. The Forest Garden produced little fruit the past season, and the trees set eight years ago seem to be on the decline. I do not think as highly of this variety as I used to.

As to cherries, we have little to report. Some seedling sand cherries bore a very good crop, but most of them bore little or none of a rather bitter and puckery fruit, but on the whole they average better than the choke cherry. The Dwarf Rocky Mountain cherry is a variety of the sand cherry; it bore no fruit, but is perfectly hardy. There are a good many seedling Russian cherries grown by the Mennonites near here, but I have had little time to investigate them. My Russian cherries, especially the seedlings, set for an extraordinarily heavy crop, more so than most of the plums, but the May freeze took all but a few specimens. The seedlings trees look better than the named varieties.

I received specimens of Mr. Knudson's hybrid sand cherry, which resembles the plum fully as much as it does the cherry, and I have no doubt that it will prove a most valuable addition to our list of hardy fruits.

Pres. Underwood: Has any one any questions to ask on this report?

Mr. E. J. Cutts: Have you ever fruited the Rocky Mountain cherry?

Mr. Cook: No, sir.

Mr. C. Wedge: I have fruited it on my place. It is not so good as the best variety of sand cherry.

Mr. J. S. Harris: You probably refer to that sent out from Colorado.

Prof. N. E. Hansen: I tested the Rocky Mountain cherry at Ames last summer and concluded it was not half as good as those selected sand cherries that we grew from seed.

Pres. Underwood: What can you do with the fruit of the sand cherry?

Prof. Hansen: We had a large patch we grew from seed that we experimented with, and we let some of them stand, and I found quite a number far better than those from Colorado.

Pres. Underwood: If you had twenty-five bushels of sand cherries what would you do with them?

Prof. Hansen: I would use them as a stock for the plum.

Pres. Underwood: Well, I do not mean the seed, I mean the fruit; what use could you make of the fruit?

Prof. Hansen: That is what *I* mean.

Pres. Underwood: Do you think the root of the sand cherry is strong enough for the plum tree?

Prof. Hansen: I don't know about that.

Mr. Harris: I think within twenty-five years something fine will come from the sand cherry. I picked out one at Ames that was very good to eat out of the hand, and we made some sauce out of it, and it had not astringency at all.

Pres. Underwood: The reason I asked the question, we had about twenty-five to fifty bushels of the fruit this summer, and we did not know what to do with it. Some children came and asked me if they could have some of the fruit, and I told them if they were careful that the foreman did not see them, as children were not allowed in the nurseries, they could have all the fruit they wanted. That was enough, we got rid of every bit of the fruit. (Laughter.) As for a stock for plum trees, I have seen plum trees, even those that had a very hardy root, I have noticed plum trees that have been killed out in the roots, which were near the surface and all bunched up, and it seemed to me they would be subject to drouth, and I would be a little afraid to use the sand cherry as a stock for plums for fear they might not have roots enough for them.

Mr. F. W. Kimball: I have found the sand cherry with roots six to eight feet long. I know of no bush with so many roots as the sand cherry. It is not an uncommon thing when pulling them up to find roots six to eight feet long.

Prof. S. B. Green: We have used the sand cherry for plum stock for about eight years. They seem to do very well. I have seen some plums budded on the sand cherry ten or twelve years ago; they were budded quite a little ways above the ground, and the whole thing would tip over easily. As to what to do with a large quantity of sand cherries, I met a man at Brainerd who thought there was no drink like sand cherry juice. (Laughter.)

Mr. S. D. Richardson: A plum grafted on a sand cherry, I think, has a better root than the ordinary plum.

Prof. Hansen: I will say this sand cherry juice that was spoken of is very nice; I think it would make a fair wine. We experimented at Ames with the European plum, but they are not a success on the sand cherry; some of them made pretty good trees, but most of them did not seem to do so well as the native plum does on the sand cherry. I have a good deal of confidence that it will

be a good stock for the native plum, but I have not had long enough experience to say for certain.

Mr. Clarence Wedge: I should think, Mr. President, that your objection that the tree might not stand the drouth would not hold good, because the sand cherry withstands the drouth better than anything known.

Pres. Underwood: That is what I wanted to find out.

Mr. Wedge: I think, as our American plum suffers from the drouth, the sand cherry would remedy that. I have had trees that in one year grew over six feet high. I have grown quite a number without pruning back, and the roots of the sand cherry held them as erect as any I have seen.

Mr. A. F. Collman (Iowa): While your secretary spoke so favorably of the Minnesota grapes, I think we have the best plums. I am very much interested in plum culture, and I obtain scions wherever I can. I have them worked on the sand cherry, and I see nothing I think should be discarded, and they have been very profitable. I have none of the European plums growing on the sand cherry.

Pres. Underwood: As I said before, we had quite a crop of sand cherries; they seemed to be very prolific, and I had them tested in a variety of ways as to their cooking qualities. They make an excellent sauce. I think they stew them a little in water, and they make an excellent sauce, highly colored, and where there is a scarcity of fruit they may be appreciated for pies, perhaps.

Prof. N. E. Hansen (South Dakota): I think eventually there will be some varieties of the sand cherries that will be very desirable. I remember four or five years ago I found some on the Missouri river that were the next thing to the common tame cherry, and this last season Mr. Wedge sent me a sample, and they were very good eating. The cherries I have produced were of the same quality as the common cherry. The seedlings we shall get from them, I think, will take an important place in our fruit growing. I think it will prove profitable to cross with the native plums.

Mr. E. J. Cutts: Will they grow from cuttings?

Prof. Hansen: They grow from root cuttings, but not from other cuttings.

Pres. Underwood: Before we pass this topic of plums I want to call on the man who knows everything about plums, Mr. O. M. Lord, who has not been on his feet once yet. I think Mr. Lord can tell us all there is to be known about the subject.

Mr. O. M. Lord: In regard to the sand cherry and plum, I think the sand cherry should be called a plum. I top-grafted several native plums on the sand cherry, and they grew without any difficulty whatever; and I tried to top-graft on some others, and they did not grow at all. Perhaps, that is one reason why the sand cherry succeeds so well on the native root.

Pres. Underwood: What kind of trees does it make grafted on the plum.

Mr. Lord: Prof. Hansen can tell you better about that than I can.

Prof. Hansen: Mine are grafted plum on sand cherry root.

Mr. Lord: Mr. Heideman has produced some fruit from them in that manner.

Pres. Underwood: What about plums proper? What can you tell us about plums?

Mr. Lord: I don't know that I can tell you anything.

Pres. Underwood: How many plums did you raise?

Mr. Lord: I had about fifty bushels.

Pres. Underwood: Which do you consider the best variety?

Mr. Lord: The Rollingsstone is the best plum in North America.

Mr. Wyman Elliot: Is it profitable and hardy?

Mr. Lord: Yes; I speak for it on my own place.

Mr. C. L. Smith: What is the best plum you would recommend for planting?

Mr. Lord: If I were to recommend a plum for general planting all over the state, I should take the Desota. I have hardly ever had a failure with the Desota. It will grow in any ground; it will grow alone, or in groups, or among other trees. If I could grow all the American plums as I have grown one or two trees from the New Ulm station, I should throw away a good many kinds. I have about fifty varieties. I think it would make the most wonderful show, top-grafted, I have ever seen. The Stoddard did very well with me last year, also the Comfort.

Mr. C. W. Sampson: How do you prevent the stinging of the plum?

Mr. Lord: The curculio takes the wild plum. The Cheney are taken, nearly all of them, while if you had no Cheney, it would take nearly all of the others.

Mr. Sampson: How do you keep them off?

Mr. Lord: Beat them off by shaking.

Mr. Smith: How about the Brahma chicken?

Mr. Lord: I don't like to tell about that. I heard that the chickens would keep all the bugs off, so this spring I fixed up my plum orchard for the chickens, put a fence around it and put over thirty chickens in, and the result was that the curculios destroyed nearly all the plums within the fence, while they did not injure those on the outside. (Laughter).

Mr. A. H. Brackett: How about the Surprise?

Mr. Lord: It did not fruit for me. The quality of it, they said at our fair, was excellent. I hardly like to give an opinion from one sample.

Mr. A. J. Philips: Have you ever fruited the Ocheeda?

Mr. Lord: Yes, I have. I like it very well. It comes a little later in the season.

Mr. S. D. Richardson: Did you ever try the Miner?

Mr. Lord: It never succeeded with me.

Mr. Richardson: I saw some parties who said they had not had any for four or five years. The Miner does well with me on its own roots.

Mr. Smith: Have you the Desota on its own roots?

Mr. Lord: Yes, sir.

Mr. Haggard: Is there a sufficient market to pay for raising?

Mr. Lord: I usually sell fifty to one hundred bushels in the market.

Mr. Wedge: What do your plums net you?

Mr. Lord: About \$2.00 a bushel, sometimes \$1.50. I had such a demand for them at home, that I did not ship any away.

Mr. Wedge: How do you like the Hawkeye?

Mr. Lord: It is a nice plum, but the quality is not very good.

Mr. Brackett: It is a very large plum, is it not?

Mr. Lord: Why, no; about as large as the Cheney.

Mr. Brackett: Those were immense they had at the state fair.

Mr. Lord: They do better on clay ground.

Mr. J. W. Murray: I find no difficulty in destroying the curculio with Paris green spray. I have had good crops where I would not have had anything if I had not used the spray. If you will give them one or two sprayings, you will find it will prevent them.

Mr. Richardson: How large was the young plum when you sprayed?

Mr. Murray: About the time the plum is the size of a small bird shot.

Mr. J. S. Harris: Perhaps I had better tell my experience in spraying for curculio. I tried it on a few trees, and my experience was a good deal like that of our friend Howell, of Wisconsin, in raising raspberries; I came out at the little end of the horn. I lost some trees by spraying with Paris green, and others were so badly injured I do not know how long it will take them to get over it. The only real sure way I could recommend to any one is to jar the tree and catch the bug and pinch him, or catch him in a sheet.

Mr. Philips: How much Paris green did you use?

Mr. Harris: I calculated to use about one pound of Paris green to 200 gallons of water.

Mr. Cook: Did you spray before the leaves had come out?

Mr. Harris: No, I sprayed after the foliage had started.

Mr. Philips: Did it injure the foliage?

Mr. Harris: It injured the foliage so it will take two or three years to recover. The fruit hung on, but it did not ripen. I think I had Cheney's with a bushel to a tree, but not a half dozen of them ripened, and the others that were not sprayed had good plums. I do not want any more spraying in mine.

Mr. Philips: There is a family living at Ft. Atkinson—English people by the name of Spry—and the lady told me her experience was just the same as that of Mr. Harris. They had one tree which they sprayed, and under the others they would spread a sheet and jar the tree and catch the curculios by jarring them off, and on the tree they sprayed the curculios took all the plums, while the trees they jarred had a good crop. They went to church one morning and sprayed the tree before they went, and when they came home from church they jarred the tree and caught thirty-two; and she says that is the only way to secure plums, or the only way to guard against the curculio, is to catch them and kill them. Spraying will not do.

Mr. Harris: That is my experience.

Mr. Cutts. The only thing that troubled me is the plum pocket.

Mr. Harris: Some of us professors disagree a good deal on that subject. One professor says it generally occurs when the weather is unfavorable. I am the professor who lays it to that. It may be a fungus that causes it, but all the same when the conditions are right for perfect pollenization your plum starts off naturally and is going to ripen; that plum pocket is not going to come. When they blossomed this year, the weather was warm. When we have some cold weather when they are about to blossom or have a little frost about that time, lots of pockets come on the Cheney. You get the blossom properly pollenized, and I do not think you will be troubled with plum pockets.

Mr. Lord: I don't know, but I don't believe pollenization has anything to do with it.

Mr. Elliot: Doctors disagree.

Mr. Lord: I believe I have written and said more on that subject than any other man in the Northwest, and I confess I don't know much about it. (Laughter.) If pollenization has anything to do with it, my experience is that there would be no growth at all if there is a lack of pollenization. My theory is that it is simply occasioned by cold weather or wet weather at about the time the plums form, when they are about the size of a kernel of wheat, but I confess I cannot prove it.

Mr. Elliot: I should like to hear from Prof. Green on the subject.

Prof. Green: I do not want to say anything about this. I think in the spring of the year when we have the plum pockets and examine them right along until the pockets are nicely developed, you would agree with me that it was formed by a fungus. I think I could convince you. There seems to be no doubt but what it winters over in the tree, but, of course, the external conditions have a good deal of influence upon the fungus. We have wheat rust more or less every year, but sometimes people say it is the warm weather that brings it on. In one sense it does bring it on, in another it does not. If the rust is there, it develops more rapidly in warm weather. When the conditions are adverse to the growth of the plum pocket—and by such conditions I mean the strong growth of the tree, a healthy, vigorous growth—I think we are not so liable to have the plum pockets. I have strongly made up my mind that it is formed by a fungus.

Mr. Harris: I have not denied that it was a fungus, but if it was properly pollenized the fungus could not get there. It may attack the most vigorous trees.

Prof. Green: It winters over in the tree.

Mr. Harris: It winters over; if it were not for those conditions you would have no pockets.

Mr. Elliot: Would spraying with any of the different solutions have any effect on the fungus?

Prof. Green: I do not think so, but you cut the trees back and burn them, that is better. We may gain a little by spraying with the Bordeaux mixture, but I think that is not much.

Mr. Cutts: Would not high cultivation be a preventative?

Prof. Green: Well, I don't know. I never saw it so bad as I did at the Farm.

Mr. Cutts: It has been said that chickens keep the ground scratched up, and this prevents it.

Prof. Green: Chickens may do some good for curculios, but I don't see that they could have anything to do with plum pockets.

Mr. Murray: If spraying is so injurious to the plum trees, is it not equally injurious to apple trees?

Pres. Underwood: It does not injure the apple.

Mr. Murray: Why should it injure the plum?

Mr. Elliot: It is the difference in the foliage.

VEGETABLES.

D. T. WHEATON, MORRIS.

The vegetable crop (1895) was abundant in this section of the state. Although there are no market gardeners here or any that raise vegetables as a business, yet there are more vegetables raised than for which there is a demand. Most of the farmers have very good gardens, and they generally raise more than a supply for their own table. The varieties grown are the more common and hardier kinds and do not equal those raised in market gardens. The demand for vegetables in the country or villages is quite limited; so it is poor policy to raise more than enough for home consumption.

To have a good garden requires constant care and attention. If the weeds are not kept down and the soil cultivated, it is useless to try to raise vegetables. Often when the garden requires attention, the farmer is busy with his field crops, and I think it an open question whether it pays to leave the field and give the garden the needed attention. If it was not for the women folks, I doubt whether many farmers would have gardens.

The meteorological conditions were not favorable to the largest growth. (I think medium sized vegetables are superior in quality to the overgrown ones). The amount of precipitation for the past year was the smallest for over eleven years. The rain came at opportune times generally, so that crops of all kinds were good. More depends upon when the moisture comes than upon the amount.

The season opened early. Most seeds were planted from the first to the middle of April. The ground was so very dry that many of the smaller seeds failed to germinate till the rains of the last days of April. The seeds that came up made a good growth, and looked finely when the cold week beginning May eleventh came. After the freeze, plants had to take a new start, either from the roots or from new seed. From this time on vegetables made a rapid growth, and a fair crop matured.

The acreage of potatoes was largely increased, owing probably to the high prices prevailing a year ago. The potato crop was heavy and they were so abundant that there was practically no market for them. Some fields were not harvested. The prices were so low that it did not pay to ship them. After the local market was sup-

plied, the only use for them was to store them away or to feed them to stock.

The beet crop was good, although the size was not the largest. Stock beets and carrots are grown to a limited extent, and those growing them are much pleased with the result. Cabbage was fine. Onions were plentiful, so much so that many were not harvested, as there was no sale for them. Sweet corn is generally raised, and the crop was never better. The acreage of field corn is rapidly increasing, and forty-acre fields are not uncommon.

Celery is grown to a limited extent, but with success. A few grow egg-plant and other of the more tender plants for home use. The bean crop was fair and is a profitable crop to raise, yet not enough are grown to supply the home market. Bush limas are grown with moderate success. The vine crops were not up to the average. The fruit was late in setting, and both squash and pumpkins were late in maturing. It seemed to be too dry for them. The tomato crop was not the best; many tomatoes were affected by the black rot, and they were small and late.

REPORT ON SMALL FRUITS.

A. H. BRACKETT, LONG LAKE.

I might say a few words in regard to my strawberries. I always make a record of my yield. Last Saturday night I was comparing the record of last year with this year. In drawing a comparison of the leading varieties, like the Warfield, Captain Jack and Glenwood, I found the yield last year and this year about the same. For instance, this year the Warfield were No. 1, and last year they were No. 2. This year they were just the reverse. The Crescent and Glenwood were No. 5. Last year the Bubach and Haverland were No. 5 and No. 3, this year the Haverland and Bubach were No. 13 and 15. I found every other variety bore really the same as last year, except those two varieties. I cannot account for it. That was one of the interesting points I wanted to bring out. I wanted to find somebody who can give me some information on the matter. This year I did not get more than half as many strawberries as I did last year. They were much better and the prices were higher; so far as the price is concerned, I realized more than I did last year. My Warfields were very fine, indeed, but I saw the greatest difference in them; they were much better than last year. I had two or three new varieties bearing this year, the Lovett, the Beverly and the Bederwood, and they all bore very well. Of course, they all bore well last year. That is about all I can say in regard to strawberries.

My currant yield was just about the same as last year, the Red Dutch, the Fay and the White Grape.

As to raspberries, the Marlborough bore very heavily, and they were very fine. The Cuthbert and Hansell did very well, but not as well as the Marlborough. The Older is a new variety I got from Iowa; they bore this year for the first time and seem to be a very fine berry. They did not bear a very large crop, but the berries seemed to be very fine. The Kansas bore very well. The Nemaha

bore very finely, but the Ohio did not seem to be as thrifty as it should have been. Anthracnose is the fault of that. The "curly leaf" bothered us very little, but I kept pounding away at it. I think I have as little as any one. I do know the "curly leaf" when I see it, but I am not so familiar with anthracnose. Take my black-cap varieties—it seems to make so little impression on the bark that I can hardly tell it.

My blackberries were very fine, and those I had in bearing bore very nicely. I have three varieties, the Briton, Stone's Hardy and Snyder. Last year I was going to throw away the Stone's Hardy. Some of my neighbors claimed they would not bear, and they were going to dig them up. They did well with me this year. They were planted two years ago, and they have acted splendidly. The plants are coming along all right. That takes in all my experience of anything I can think of at present.

Mr. J. S. Harris: Mr. E. E. Harris is a member of that committee, but he has sold out and moved to Wisconsin. His experience with strawberries was better than that of any one else in that region. His best strawberries were the Warfield, fertilized with Michael's Early. His experience with raspberries this year was similar to what I have already said. He says he can get better results from blackcaps by pulling out the surplus suckers and letting the canes grow to their full length during the summer than to cut them back and get a large quantity of young shoots in the way. This is another objection: if you cut back the plants when they are two feet high, it will induce the vine to make a later growth in the fall, and it is liable to take injury. I know of an experience we had: there were some plants close to the road, and we cut them back in August, and the result was, they started a new growth, and some threw fruit buds out, and they were good for nothing. He advocates close planting and then thinning out.

STRIPPING GRAPES AFTER A FROST.—The question is frequently asked by our horticultural exchanges, "Does it pay to strip off the new growth after being killed by late frosts, as was the case this spring?" The "Leader" has interviewed several of the prominent growers, and nearly all answer in the affirmative.

Some others are of the opinion that it makes no difference, but we fail to find any one who thinks it injures the crop. Different methods were followed, some cutting off the dead sprouts, leaving about an inch next to the woods, while others tore it entirely off, compelling the new growth to start from the wood. The latter plan is found to bring the better results. It is also found that the earlier the vines are stripped after the frost, the better they yield. Most of the growers say that in case of frost in the future they will proceed immediately to strip every vine. Vineyards that were so treated this year will yield from a fourth to a half a crop.—*Lawton Leader*.

FRUIT AT THE 1896 IOWA STATE FAIR.

(See plate on opposite page.)

The fruit exhibit at the Iowa State Fair, was a grand success under the management of A. F. Collman, of Corning. Mr. W. Green, of Davenport, who is an expert in that line of work, assisted in the decoration. Floral hall was decorated with evergreen wreathing, gracefully draped in squares across the hall, and the walls were trimmed with evergreen, flowers and bunting. The florists in Des Moines greatly helped to make the hall attractive with a very fine exhibit of rare flowers and plants.

The fruit exhibit was the largest and best the state ever made. Choice fruits from the east and west, from the north and south, filled the hall to overflowing. The fine exhibit from the agricultural college grounds was very attractive. Many fine peaches were on the tables from several counties in the state. In fact, all the exhibits were attractive. The floral hall should be enlarged to make more room for another year. (Just like us. Sec'y.)

Principal exhibitors were:

SOUTHERN DISTRICT.		APPLES.	
J. F. Record, Glenwood.....	80	Varieties.	
A. F. Collman, Corning.....	90	"	
CENTRAL DISTRICT.			
J. Wragg & Sons, Wauke.....	100	"	
B. Steward, Ivy.....	80	"	
Isaac Dawson, Rising Sun.....	75	"	
J. M. Chaffee, Mitchellville.....	40	"	
J. W. Dawson, Rising Sun.....	38	"	
NORTHERN DISTRICT.			
L. G. Chute, Delaware Co.....	45	"	
E. H. Smith, Dubuque.....	30	"	
R. P. Speer, Cedar Falls.....	40	"	
J. B. Mitchell, Cresco.....	200	"	
C. G. Patten, Chas. City.....	150	"	

There were some very fine seedling apples shown by Mr. C. G. Patten and Mr. B. Steward.

INOCULATING THE SOIL.—A writer in the Contemporary Review tells of the recent discovery of a German professor which bids fair to solve the problem of worn-out lands and will transform in many respects the treatment of soils. It consists of the inoculation of the soil with pure cultures of bacteria for the purpose of promoting plant-growth. Some conception of its importance may be afforded by the statement that it offers a practical solution of the great problem of how to utilize for vegetation the boundless stores in the air of one of the most important of all plant-foods, viz., nitrogen—a problem which, we may add, has long exercised the minds of the plant physiologist and agricultural chemist.

ANNUAL MEETING, MINNESOTA BEE-KEEPERS' ASSOCIATION.

R. K. JAKUES, SECRETARY.

The seventh annual meeting of the Minnesota Bee-Keepers' Association was held at the court-house, in the city of Minneapolis, on the 5th and 6th of December, 1895.

The officers elected for the year 1896 were: President, J. P. West, Hastings; secretary, E. K. Jaques, Crystal; treasurer, L. E. Day, Clinton Falls; vice-president, first district, C. Theilmann; vice-president, second district, J. B. Livingston; vice-president, third district, George Penny; vice-president, fourth district, Mrs. H. C. Acklin; vice-president, fifth district, Wm. Urie; vice-president, sixth district, J. L. Gray; vice-president, seventh district, J. M. Doudna.

Many bee-keepers were assembled from various portions of the state.

The first subject of importance to come before the association was in relation to kind and size of hive best suited to bee-keeping in Minnesota. The discussion that followed revealed the fact that at present there is no real agreement upon this subject. The prevailing opinion, however, appeared to be that Minnesota bee-keepers will do well to avoid either extreme.

Following this, E. K. Jaques presented a paper on the subject "How to produce Fine Comb Honey." He urged the necessity of careful systematic work from start to finish. All colonies should be strong—kept so by uniting the weak ones and abundant feeding when required. Hive-stands should be up from the ground and kept level. He would use full sheets for foundations, and urged the necessity of careful work in putting it in, that it may be where it should be, in the middle of the section. He would not give surplus until the bees are ready to use it. This paper elicited much discussion. I may here add that the quality of honey produced in Minnesota is not excelled in any state, a fact which the exhibit made at our last state fair abundantly proved.

The association was then favored with a paper from Prof. O. Lugger, state entomologist, on the much mooted question, "Is the queen bee capable of fertilizing the egg laid by her so as to determine its offspring; or is that determined by the food fed to the larvae by the bees?" This paper was well received, and like the other did not pass without being freely commented upon.

Mr. C. Theilmann's paper on "Honey as Food and Medicine" was next listened to. He contended that honey was one of the very best of all foods; that it was highly nutritious, and easily assimilated; that it should find a place upon every table.

Miss Kate Howe, of Kellogg, Minn., was not able to be present but sent a paper on "The Practical Question, Pay in Bee-Keeping." She urges the fact that bee-keeping pays as well as other kinds of farming; that while there are many sad failures, it is usually owing to the mismanagement of the apiarist.

The question of when and how much shall we use foundation was generally discussed. The majority appeared to be in favor of full

sheets in sections and for the use of *starters* only in the brood chambers.

J. A. Howard read a paper on "Alsike Clover," which was of much value, all being interested in this valuable clover, the prevailing opinion being that it is one of the best clovers for forage purposes as well as a good honey plant.

The following resolution was unanimously adopted: *Resolved*, that we hereby tender our sincere thanks to the officers of the Minnesota State Horticultural Society and to the officers of Hennepin county who have the charge and care of the new court-house, for the many favors received from them during the convention and for the use of the room so generously furnished by them.

In conclusion, allow me to state that in Minnesota a great interest is felt by all bee-keepers in the passage of some law by which the ravages of foul brood may be stopped. This scourge is slowly but surely spreading. It is to be hoped that our next legislature will consider this matter carefully.

In order to show the feeling existing among the bee-keepers of the state, I call attention to the following resolution passed by the bee-keepers of southern Minnesota at their annual meeting on the twenty-fifth of September last:

WHEREAS, There now exists in several localities in this state and in our near vicinity in neighboring states, a disease in our stocks, known as foul brood, which has proved to be very destructive and contagious, completely destroying bees in large territories, and

WHEREAS, it is the unanimous desire of the Southeastern Minnesota Bee Keepers' Association that this infliction shall be stamped out.

Now, therefore, be it resolved, that a committee of three be appointed by our president—of which he shall be ex-officio chairman—to attend the annual meeting of the Minnesota State Bee-Keepers Association, and that they be instructed to co-operate with said association in any measures that may be decided upon to control and prevent the spread of this disease.

JOHN TURNBULL, La Crescent,

Chairman Ex-Officio.

Committee—S. W. JUDGE, Pickwick,

W. J. STAHMANN, Weaver,

JOSEPH H. BOLTON, St. Paul.

The past year has been a prosperous one for Minnesota bee-keepers. A good yield of excellent honey has been obtained and a large increase to the number of stocks. Prices have been low, but the indications are now that honey will bring a better price soon.

PRESERVATIVE FLUIDS.—Mr. E. M. Burch, Spokane Falls, Wash., writes that he has been experimenting with fruit preservatives and has found that first-class olive oil will keep all kinds of delicate fruits in perfect condition indefinitely; also, that purified glycerine will keep light colored berries and cherries in perfect condition.—*Canadian Horticulturist*.

HOUSE PLANTS.

AUG. S. SWANSON, ST. PAUL.

What I can add to the general knowledge of house plants, I do not know; the subject is too comprehensive to allow me to go into a general discussion of it, neither have I anything new to add in the way of new plants; I know of none. But there are some old favorites which seem to have dropped almost out of sight lately—at least it is seldom we meet them in any collection of house plants. I refer to our grandmother's favorites, the *Camelia Japonica* and *Azalea Indica*. Here are two of the most useful and satisfactory plants for a living room; they last forever, I might say; at least, they may both be grown in pots for many years much the same as the common *Oleander* and with very nearly the same treatment, except not to set them in the hottest sun in the summer time; rather select a cool, moist and shady spot and plunge the pot to the top in the ground, where, if soaked often with water, they should thrive till fall, removing them then to the house ahead of the time hard frosts are expected. Still, I would not move them in too early; better if they can be covered or in some manner be protected from the frost during cold weather. They will be much better for being left out as long as possible in the fall, as they enjoy cool, damp weather. When taking them into the house, give as light and cool a place as you can to start with; they really ought not to be taken into the living room until about Christmas. From that time forward a little warmth will do no harm, and if kept light they will soon commence to unfold their gorgeous flowers, which will remain in a perfect state for a very long time. But remember to always keep them rather moist, not, however, soggy or sour, as they are very particular about that, but they must not stand dry for any great length of time. If ever they should happen to get real dry any time, do not try to water them by pouring water on top of the soil, but plunge them in a tub of water and let them remain for some hours until they are thoroughly soaked. In re-potting always keep them in rather small pots, well drained, and use peat soil with some sand added. If no such soil is at hand, use some old leaf-mould; that is, the soil from the surface in the woods or from under old trees, soft wooded trees being the best. Never use any kind of manure, except very old, decomposed cow droppings. The time for re-potting is the early spring, when they have finished blooming; at the same time the knife may be used to some extent in pruning so as to keep them in good form.

Another old plant which is very rare is *Antharium Scherzerianum*. This is a beautiful evergreen plant with twelve to eighteen inches long dark green leaves which last for years. The flower to some extent resembles the well known *Calla lily* on a smaller scale, the flower being three to four inches long, brightest scarlet red and lasts in good condition for months. The plants bloom naturally in winter, and I know of none more satisfactory for house culture, provided it is given moisture enough, protected from sudden changes in temperature and kept rather shady.

Another good old plant for the house in summer is the Gloxinia. I know of no blooming plant that will do as well in a close warm room in deep shade in summer, and a prettier plant for the pot I do not think there exists. I can hardly imagine anything more handsome than a well grown plant of Gloxinia in bloom, except more of them, as there is quite a variety in the matter of coloring from the darkest and richest crimson all through the different shades of red to pure white, and the same in blue—you may have them from the palest tint of lavender to the deepest, darkest of blue. There is also a new section or strain that comes in striped, mottled and punctuated colors on light ground.

Another plant I want to speak for is the Begonia. In its great variations, this plant I shall always place at the head of any list of useful and charming house plants. For a fact, if I could have only one plant in the house, it should always be a Begonia. There has in recent years been great improvement in the Begonia; we may today have them with the elegant foliage of the Rex section with flowers approaching the best of the new hybrid Tuberous-Rooted Begonias in size and brilliancy of coloring; but there are a great many of the older varieties that are, in my estimation, ahead of anything else as house plants in winter. What is there, for instance, that is richer or more elegant than a well grown specimen of *Metallica*, with its most charmingly formed and cut leaves, its rich metallic color shining in the sun like polished bronze, and the grand pink clusters of bloom? or the *Begonia Rubra* with its great pendant clusters of bright scarlet flowers, which last for months? This plant alone, if handled right will keep you with flowers all winter through; yes, you may have it in full bloom the year round. There are a great many Begonias that would head the list of plants for the house. Yet, they are, without exception, all good as such. Take the *Incarnata* with its varieties. They bloom freely during the darkest part of the winter, viz., December and January; and with its rich pink coloring it is about as pretty a cluster of flowers as you can see in a room at that time of year. If you desire something more modest than the aforementioned varieties, take the *Weltoniensis* for pink and *Dregii* for white. There is as pretty a pair of winter blooming plants as may be found.

Or if you are interested more in foliage take the Rex Hybrids, and I do not believe there exists a handsomer foliage plant that is adapted to house culture than many of the varieties of these beautiful plants with their broad, handsome leaves, colored and shaded in such an intricate manner as to almost make them a study, representing, as they do sometimes, fine patterns of lace-work. Yes, each leaf is almost a picture in itself. Then imagine a specimen four to five feet in diameter, with hundreds of leaves, making it a perfect ball, with the leaves completely hiding the pots, and upright three to four feet. Such a specimen may easily be produced in any room with moderate temperature with a little attention. The latest additions of hybrid varieties raised give us with the handsome foliage of the Red Begonia the beautiful flowers of *Bey Sowtrana* produced freely in midwinter. In this class of plants, you may have the most beautiful flowers as well as foliage in the same plant.

Another reason, and I think it a pretty good one, why I place the Begonias at the head of any list of house plants, is because they are most easily grown, and may be grown to greatest perfection in the living-room, because they are plants that are satisfied with a very limited amount of sun and light, and then they are always clean and free from insects. You do not have to wash, spray or fumigate. They are plants that love a light, rich and porous soil and plenty of pot room, and like to be re-potted frequently in their growing period.

The proper way to place them, as well as many other plants in the room, is near a window on a low table, the top of which is covered with a shallow pan of zinc or galvanized iron, about two to three inches deep. This pan to be always supplied with water, in which place something to place the plants upon so as to just raise the pot above the water. I know of nothing that is better for the purpose than pieces of common brick. It is wonderful what a difference this makes to the plant by supplying the surrounding atmosphere with a little moisture. I have an example of that in a little plant of *Pilea* that has stood in a small two-inch pot on a standard raised about a foot above the water in an aquarium in my office for eight months, in quite a hot and sunny position too, and very seldom getting a drop of water in the soil, not oftener than once a week; and still the plant is thriving and doing well. The finest specimens of *Begonia Rex* I ever saw were produced in a living-room grown as proposed, surrounded with a thin sheet of water.

There is one contrivance in very general use for setting plants on in a room that I must condemn as the very poorest invention for the purpose; it has not a single redeeming feature to recommend it for the use it is intended for. It is the common wire stand I have reference to.

To my little report on house-plants allow me to add a plea for a more universal use of plants in the living rooms. There is nothing that makes a better impression on a stranger coming to a farmhouse, especially in winter time, than a few bright flowers in the window. I am not able to better illustrate this than from what I saw in a newspaper not long ago, headed "Safety in the Love of Flowers." Luther Loflin Mills, a prominent and well-known lawyer of Chicago said that when a boy he frequently accompanied his father, who was a wholesale merchant, on collecting trips through the Northwest. They had to travel by wagon, and as the father would have large sums of money about him, it was often a problem where they could safely put up for the night. "My boy," the old man used to say, "it is safe to stay at a house where there are flowers in the window."

And I think no one will deny that flowers do exercise a softening influence over our natures, make us take more comfort and rest at home if we are surrounded by them; somehow, I imagine, they have a great influence for good, especially as regards children. It is my opinion that if every child, boys as well as girls, was brought up in a home surrounded by living plants and flowers, and thought some of the mystery concerning them, and given an opportunity to care for them and administer to their few wants, we should have a great deal less of crime and more of happy homes.

NOTES ON EUROPEAN HORTICULTURE.

PROF. N. E. HANSEN, BROOKINGS, S. D.

During the summer of 1894, I visited a large number of the leading schools of horticulture, nurseries, seed farms, parks and botanic gardens in Germany, Russia, France, England, Denmark, Sweden, Austria and Belgium. The object of my four months tour was to make a comparative study of the horticulture in Europe and America. It would be too long a story to give a detailed account of all the points of interest noted, but brief notes on a few of them may be of interest. Some are suggestive, rather than of immediate practical application.

In a general way, horticulture in Europe is *intensive*, in America *extensive*. This is a natural result of high priced land and cheap labor in Europe, and cheap land and high priced labor in America. This is why we find the labor-saving machinery so essential here. In the largest nurseries in Europe, I found fruit trees planted so close both ways, that cultivation by horse power was impossible. Tree diggers are unknown. Everything, except plowing, is done by hand; and on some plots even the horse is superseded by the spade. Much of the lighter work of cultivation is done by women, and when school duties permit by children.

One of the leading points of difference is the greater attention paid to the ornamental part of horticulture. Landscape gardening is much more practiced than with us. It is one of the fine arts; hence, comes naturally at a somewhat late stage in the development of a country. The popular taste for flowers appears greater than here. Perhaps, this is in part due to the numerous parks and botanic gardens.

Parks—I visited a large number of the principal parks in the large cities, including London, Paris, Hamburg, Berlin, Copenhagen, Warsaw, Moscow and Kiev. Many of these are in connection with botanic gardens. I was greatly impressed with the taste and skill displayed in the planting, care and management of the parks, and the universal use made of them by the people. Many of the parks have little playgrounds especially for the children, where they can play games and dig in the sand to their heart's content. Concerts are also given at frequent intervals in many of the parks. It is a remarkable fact that many of the great parks of Europe were formerly royal hunting grounds and deer parks, which, in later times, have been turned over to the public and transformed into the present grand pleasure grounds. Hence, we find here many magnificent old trees, veritable giants of the forest, as a prominent feature.

In order to make suitable provision for parks in the future that will be worthy of us here in the great northwest, we should begin now and set aside tracts of land before it becomes too valuable. No city, small or large, should neglect this. It requires many years for the trees to attain the size which gives the air of majesty and grandeur to the old parks of Europe, hence, a beginning should be made as soon as possible, and the native trees already standing on the grounds saved whenever possible. Park-making is a subject understood by few people, and only those skilled in the art of landscape

gardening and well versed in western horticulture, and acquainted with the peculiar conditions of our soil and climate, should be entrusted with the laying out and management of parks. There should be permanence in the management to guard against undesirable changes in half completed plans. Park-making demands a prophetic eye, one that can see what the park looks like after one, two or three decades.

The botanic gardens of Europe interested me greatly. America is certainly far behind in this respect. We have very few botanic gardens. Every city of any importance in Europe has a large and well kept arboretum and botanic garden. Every tree is labeled with both the scientific and common name and that of its native country. In this way the gardens are great popular educators, and people become able to recognize the various plants as familiar friends. If one knows the name and habitat of a plant, it certainly increases one's interest in that plant.

American Trees in Europe.—I found many of our native species of trees and shrubs planted freely in the parks and gardens. But our trans-Atlantic brethren have done much more with them than we have. Plants tend naturally to vary a great deal from the seed or by bud-variation. Taking advantage of this tendency to variation, the European gardeners, who are constantly on the alert for novelties, have originated and propagated a great number of varieties of our American species, as well as of their native species. Hence, we find these ornamental sports or variations very common; some with weeping, upright, pyramidal, dwarf or other unusual habit of growth; others with red, purple, yellow or white variegated leaves; still others with leaves of unusual size and shape, or with characteristic manner of flowering. In the largest nursery on the continent (L. Spaeth, Rixdorf, near Berlin, Germany), I found one species of European oak offered in upwards of fifty named varieties, while many American species, such as arbor vitæ, box elder, soft maple, black locust and white ash, were grown in many distinct named varieties. These remarkable variations were indeed an interesting study. But many, if not most of these variations will not be hardy in the west, because they have been developed from eastern forms of the species, which are not adapted to western conditions. Hence, we must repeat this work and develop these desirable varieties from the northwestern form of the species.

Schools of Horticulture.—I visited a large number of the leading schools of horticulture, agriculture and forestry, and was very favorably impressed with them. Their courses of study are shorter than ours, being from one to three years; but considerable preparation is usually required for entrance and a practical experience of two years. This period of practical experience is a great help, as the students grasp the instruction much quicker. The courses of instruction are strictly technical, the underlying sciences being studied only with reference to their horticultural or agricultural application. The schools are nearly always distinct and separate from any other school, so that all the students are interested in the same line. Field excursions in all lines are a prominent feature. In the

higher schools no manual labor is required, but in most of the schools practical work alternates with the lectures and class-room exercises. A large botanic garden and arboretum is a prominent feature of every one of these schools, and is regarded as an indispensable part of the equipment. The magnificent museums of horticulture, agriculture or forestry I saw in Berlin, Eberswalde, Munich, Proskau, Hohenheim, Geissenheim on the Rhine, Klosterneuburg near Vienna, Copenhagen, Moscow and other places, made me reflect that we have much to do and to learn in the way of college equipment. But probably the strictly technical courses of study in the European schools would not be best for our purpose. For our American schools, I think the present system is preferable, that is, to include some studies directly pertaining to the duties of citizenship and even many of the studies which in European schools are a requisite for entrance.

Russia.—I found the Russians to be a very kind and hospitable people. They have a high regard for America and Americans. From Berlin, I went to Warsaw, in Poland, and thence east to Moscow, which is twelve hundred miles east of Berlin by rail. Thence south to Kiev, six hundred and twenty-five miles southeast of Moscow, stopping off at several places on the way; then west to Germany again. Russia is truly a country of magnificent distances. Passports are absolutely necessary, both for entering and leaving the country, and the police authorities must stamp the passport at every city one stops at over night. This strictness seems strange to one accustomed to American customs. I was greatly pleased with Russian horticulture, and picked up a number of points which I am endeavoring to test here and will report in due time. The venerable Dr. Schroeder is still professor of horticulture at the Royal Agricultural College in Moscow. Prof. Schroeder is a native of Denmark and has been in the employ of the Russian government as horticulturist for fifty years. He has contributed much to the horticultural literature of Russia. I ordered some promising novelties in trees and shrubs which arrived during the winter, and are now growing on the grounds of the Iowa Agricultural College at Ames. At Moscow and many other places in Europe, I found Prof. Budd's visit in 1882 remembered with pleasure, and all united in sending greeting.

The Russian government displays a progressive spirit in many lines. It is wide awake on the forestry question, and its government forestry service is extensive and well organized. Hundreds of thousands of acres of forest have been planted on the vast steppes, and a strict supervision is exercised on all timber cutting. The beneficial influences of forests on climate is well known, and the great forests of Russia today stand as magnificent illustrations of the wise forethought of the Russian government.

The Russian government has a good method of getting hold of advanced methods in all lines. There is a system of traveling fellowships which enables promising students to travel and study for two years or so in the various countries of Europe. Upon returning, these men are given government positions. The latest ideas are thus quickly grasped and brought into use at home.

Budding on Siberian Stocks.—Root-grafting the apple is not practiced in Russia, or indeed in any part of Europe that I visited. Budding is the universal method. In the extreme sections of Russia, where the seedlings of the commercial apples fail by root-killing, the Siberian crab is used as a stock. The seedlings are budded at the crown. Prof. Schroeder told me that the trees were somewhat dwarfed, but bore two years earlier.

This is a fact well worth noting. Here in the northwest, where trouble is often experienced in the nursery from root-killing, budding on ordinary apple seedlings is entirely out of the question, although we know from eastern experience that budding gives smoother trees than root-grafting. I intend to experiment in this line, as I was much pleased with the trees at Moscow that Professor Schroeder showed me as having been worked in this manner. We all know that top-grafting on Siberian crabs has not proved successful in most cases, but budding at the crown on young seedlings may give better results.

Vladimir Cherries.—At Moscow I found the markets flooded with Vladimir cherries, coming mostly from the province of Vladimir, one hundred and fifty miles east of the city, where there are immense cherry orchards. On the famous Sparrowhill heights, south of Moscow, where Napoleon stood September 14, 1812, when he first beheld the city, I visited extensive cherry orchards, mostly of a variety of the Vladimir type, or race. The Vladimir is a fine, black, glossy cherry, fully as large as Early Richmond, with very small pit and colored juice, and of excellent quality. As tested in Iowa and the northwest, it does not do well on Mazzard or Mahaleb stocks, but I learn that the Mennonites in Minnesota find a form of this race succeeds on its own roots. In Russia it is never budded, but is propagated by seeds or sprouts. Professor Schroeder told me it comes very nearly true to seed. The trees are naturally short lived, ten to twelve years, and dwarf in habit, ten to fifteen feet, and are grown in bush form with several stems, and as the older ones die down they are cut out and the others take their places. This cherry will stand forty degrees or more below zero. In some parts of Russia it is used to some extent as a stock for other cherries. It would be well to experiment with growing cherries on their own roots here in the northwest. We have wasted enough money by using the tender Mahaleb and Mazzard as stocks for the cherry. A quantity of pits of this Russian Vladimir cherry will be imported the coming season, and we trust will arrive in good condition. It is time both the Mazzard and Mahaleb were discarded as cherry stocks for the northwest, and nature's method tested for a time.

Varying Hardiness.—One of the main lessons to be learned at the great arboretum of the Royal Agricultural College at Moscow, is the varying hardiness of a species extending over wide areas. Professor Schroeder accompanied me in several walks through the arboretum, and emphasized this lesson by many illustrations. For example, the Russian form of the Scotch pine (*Pinus sylvestris Rigensis*) is far superior in all respects to the west European form. The same difference obtains in the case of the Russian variety of the

Norway spruce. The trees of Norway spruce grown from German seed have the terminal buds frozen and the foliage reddened in winter, while the Russian form is perfectly hardy and far superior for ornamental planting or for timber.

It is time that planters in the severer sections of the northwest should look to obtaining the hardiest known form of all species of timber trees. Northern tree seed for northern planters should be the rule.

Edible Russian Olive.—At the Royal Horticultural School at Potsdam, near Berlin, I found a tree of the wild olive (*Elæagnus angustifolia*) with edible fruit over an inch long. It was the only tree of the kind in Europe. It was brought by the director of the school, Dr. Karl Koopman, from Margelan, in central Asia, north of Turkestan and west of China. A few scions were imported and the grafts are now growing on the grounds of the Iowa Agricultural College. If it proves as hardy in the northwest as the typical Russian wild olive, it will be an acquisition.

Rosa Rugosa Hybrids—The experiments at the Iowa Agricultural College, by Professor Budd and the writer, in hybridizing this iron clad Russian rose with the best cultivated varieties, have already been described in this report. I am pleased to report that two rose specialists in Germany and Russia have been experimenting in this same line. At Erfurt, Germany, I found and obtained some of these as yet undisseminated. Some bloomed the past season and are very promising. None, however, were superior to some obtained at the Iowa Agricultural College, one of which showed sixty-six petals—a beautiful, double, dark crimson rose. It appears that from this Russian species will soon come an abundance of hardy double roses for the northwest.

Seed Selection.—The greatest seed farms in Europe are at Erfurt and Quedlingburg, Germany, where hundreds of acres of flower and garden seeds are grown for shipment to all parts of the world. I saw great fields of German asters in full blossom. The careful work of seed selection, and "rogueing," or destruction of inferior plants, was being carried on. The perfect plants are marked by a fibre of raffia; this seed is saved for home use the next year. The vivid colors make it impossible for the experts to work at this careful selection all day long. It was very interesting to watch this careful method of selection, inasmuch as all our improved varieties of flowers and vegetables have been developed and improved in this manner. It suggests the thought that some of our wild species of flowers and vegetables may and should be developed in like manner

COLUMBIAN RASPBERRY.—We have fruited this raspberry at our Burlington fruit experiment station, during the present season. The writer visited the plantation there on the 15th of July, and found the Shaffer and Columbian fruiting side by side. The chief note made was that Columbian was the most heavily laden with fruit; otherwise they were very similar.—*Canadian Horticulturist*.

Program

OF THE

THIRTIETH ANNUAL MEETING

OF THE

Minnesota State Horticultural Society,
To be held in the offices of the County Commissioners in the Court House, at Minneapolis, Minn., Tuesday, Wednesday and Thursday, December 1, 2 and 3, 1896. Ladies are especially invited. Send or bring questions for the Question Box.

St. and Second Av. S., room without board—one in a room—75 cts. per day; two in a room—50 cts. per day.

NOTICE TO MEMBERS OF COMMITTEES.

Please come prepared to make reports on the

vary before the date of the meeting.

TO THE BEE-KEEPERS.

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REDUCED RAILROAD RATES.

PROGRAM.

TUESDAY MORNING SESSION.

10 o'clock.

General Subject—Small Fruits.

Organization.

Appointment of committee on creden-
tials.

Report of committee on small fruits.

C. B. Crandall, Red Wing,
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Fruit

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Secretary.

for the

TUESDAY AFTERNOON SESSION

2 o'clock.

General Subject—Strawberries.

The "Nimble Sixpence," and how to Corral Him in a Strawberry Bed,
Mrs. Anna B. Underwood, Lake City.

TWELVE FIVE MINUTE PAPERS.

1. Best Three Varieties of Strawberries for Market,

W. S. Widmoyer, Dresbach.
2. Best Three Varieties of Strawberries for Home Use,

Martin Penning, Sleepy Eye.
3. Soils Adapted to the Culture of the Strawberry,

O. M. Lord, Minnesota City.
4. Preparation of Soil for Planting Strawberries, J. A. Sampson, Excelsior.

5. Planting Strawberries,

A. M. Shepherd, Minneapolis.
6. Cultivation of the Strawberry,

C. B. Crandall, Red Wing.
7. Irrigation of Strawberries,

M. W. Cook, Rochester.
8. Mulching Strawberries, M. Pearce.

9. Gathering and Selling the Strawberry Crop, C. W. Sampson, Eureka.

10. Care of Strawberry Vines after Harvest, Wm. Sandrock, Rushford.

11. Second Year's Treatment of Strawberry Vines,

E. J. Cutts, Howard Lake.
12. Winter Protection of Strawberries,

O. C. Gregg, Lynd.

Appointment of committees on award of premiums, president's address, obituaries and final resolutions,

TUESDAY EVENING SESSION.

7:30 o'clock.

General Subject—Addresses and Annual Reports.

President's annual address,
J. M. Underwood, Lake City.

Annual report of the executive committee,

Wyman Elliot, Chair'n, Mpls.

Annual report of secretary,
A. W. Latham, Minneapolis.

Annual report of treasurer,
A. H. Brackett, Long Lake.

Annual report of librarian,
(The library is at No. 207 Kasota Block, Minneapolis.)

A. W. Latham, Librarian.
E. A. Cuzner, Assistant Librarian.
(The assistant has charge of the reports stored at Pillsbury Hall, State University.)

An Ideal Farmer's Home,
Mrs. O. C. Gregg, Lynd.

Medicine for Tree Sharks,
J. P. Andrews, Faribault.

The State Press and its Relation to Horticulture,
E. A. Webb, Ed. Northwestern Farmer.

'Ninety-Six as a Schoolmaster,
F. W. Kimball, Austin.

WEDNESDAY MORNING SESSION.

9 o'clock.

General Subject—Apples.

Report of committee on apples,
Prof. N. E. Hansen, Brookings, S. D.
E. H. S. Dartt, Owatonna.
C. L. Blair, St. Charles.
Sidney Corp, Hammond.
W. L. Parker, Farmington.

Solid Comfort in a Minnesota Orchard,
Clarence Wedge, Albert Lea.

FOURTEEN FIVE MINUTE PAPERS.

1. The Common Apple, the Crab and the Hybrid; Difference between Them, Characteristics, etc.,
Prof. S. B. Green, St. Anthony Pk.

2. Minnesota Seedling Apples. What are They, and Their Value?
J. S. Harris, LaCrescent.

3. Russian Apples that are Worthy of Propagating,
Wm. Somerville, Viola.

4. Pruning Apple Trees; Why, When and How,
S. D. Richardson, Winnebago City.

5. Productiveness of Hardy Varieties Compared,
D. F. Akin, Farmington.

6. Top-Working Apple Trees; Purpose, Methods and Results,

J. P. Andrews, Faribault.
7. Setting a Minnesota Orchard; How, When and Where,
A. K. Bush, Dover.

WEDNESDAY MORNING SESSION—
Continued.

8. Location of an Orchard,
F. M. Kilbourne, Lakeville.
 9. How to Plant an Orchard,
J. A. Howard, Hammond.
 10. Cultivation of an Orchard,
J. M. Underwood, Lake City.
 11. Mulching and Irrigation in the Orchard,
D. R. McGinnis, St. Paul.
 12. Protection of the Orchard from Wind, from Winter's Cold and from Summer's Heat,
W. L. Parker, Farmington.
 13. Gathering, Storing and Marketing the Apple Crop,
E. H. S. Dartt, Owatonna.
 14. Uses of Apples in the Home,
Mrs. C. Wedge, Albert Lea.
- The Present Status of the Hardier Russians,
Prof. J. L. Budd, Ames, Ia.

LIFE MEMBERSHIP FEE, \$10.00.

This may be paid in two equal annual installments.

Life Members are entitled to a file of back reports, a library in itself.

WEDNESDAY AFTERNOON SESSION.
2 o'clock.

General Subjects—Experiment Stations, Plums, Grapes and Peaches.

- Superintendents of Trial Stations, 1896.**
Prof. S. B. Green (Central Station)
E. H. S. Dartt St. Anthony Park
O. M. Lord (grapes) Owatonna
H. S. Somerville Windom
J. L. Albert Lea
Mr. Eureka
Wm. Somerville Minnesota City
S. B. Green Excelsior
La Crescent
Montevideo
Sauk Rapids
Viola
Stations,
Prof. S. B. Green, St. Anthony Park.
Report of committee on plums and cherries.
W. S. Widmeyer, Dresbach.
Clarence Wedge, Albert Lea.
Martin Penning, Sleepy Eye.
- The Farmer's Plum Grove,**
O. C. Gregg, Lynd.
- Some Thoughts on Northern Plums and Cherries,**
M. E. Hinkley, Pres. N. W. Ia.
Hort. Soc., Marcus, Ia.
- Report of committee on peaches**

Report of commit

Roy Underwood, Lake City.
The Future of Minnesota Vineyarding,
A. A. Boat, Excelsior.
How to Make a Minnesota Vineyard Pay,
Walter P. Rogers, Excelsior.

WEDNESDAY EVENING SESSION.
7:30 o'clock.

General Subject—Floriculture and Arboriculture.

- Report of committee on out-door herbaceous plants.**
M. Windmiller, Mankato.
A. S. Swanson, St. Paul.
- Report of committee on house and greenhouse plants.**
Satisfactory Plants:
Mrs. Wm. Lyons 224 Clinton Av., Minneapolis.
Mrs. D. Morrison, Villa Rosa, Minneapolis.
E. A. Cuzner, Essex and 27th Av. S. E., Minneapolis.
- Some Hardy Perennials,**
Mrs. Anna B. Underwood, Lake City.
- Flower Culture Among the Children,**
Mrs. Mildred M. Barnard, Chairman
Man Flower Committee, Minneapolis Improvement League.
- Desirable Annuals,**
Miss Emma V. White, Minneapolis.
- Report of committee on forestry.**
C. L. Smith, Minneapolis.
Alfred Terry, Slayton.
S. M. Owen, Minneapolis.
- The Growth of Hardwood,**
Fred H. Gilman, Ed. Miss. Valley Lumberman.

THURSDAY MORNING SESSION.

9 o'clock.

General Subject—Fruit List.

- Report of committee on fruit list,
Clarence Wedge, Albert Lea.
J. P. Andrews, Faribault.
Prof. S. B. Green, St. Anthony Park.
- Report of committee on seedling fruits,
J. S. Harris, LaCrescent.
- Girdling to Promote Fruitfulness,
E. H. S. Dartt, Owatonna.
- Windbreaks for Orchards,
S. D. Richardson, Winnebago City.
- The Preparation and Use of Manure for
Horticultural Purposes,
Prof. Harry Snyder, Univ. Farm School
- Reports of vice-presidents,
E. H. S. Dartt, First Congressional District,
Owatonna.
- S. D. Richardson, Second Cong'l District,
Winnebago City.
- Mrs. A. A. Kennedy, Third Cong'l District,
Hutchinson.
- R. S. Mackintosh, Fourth Cong'l District,
St. Anthony Park.
- Col. J. H. Stevens, Fifth Cong'l District,
Minneapolis.
- J. O. Barrett, Sixth Cong'l District,
Brown's Valley.
- Mrs. Jennie Stager, Seventh Cong'l District,
Sauk Rapids.
- Present Stage of the Sorghum Industry,
S. H. Kenney, Morristown.
- Report of committee on fruit blossoms,
R. S. Mackintosh, St. Anthony Park.
L. R. Moyer, Montevideo.
- Announce election for the afternoon
and renewal of membership.

THURSDAY AFTERNOON SESSION.

2 o'clock.

General Subject—Election of Officers, Irrigation and Vegetables.

- Report of committee on irrigation,
O. H. Thompson, New London.
P. M. Woodman, Minneapolis.
Prof. W. M. Hays, St. Anthony Park.
- Irrigation in Minnesota,
Prof. W. M. Hays, St. Anthony Park.
- How to Run a Nursery,
J. Cole Doughty, Lake City.
- 3:30 o'clock—Annual Election of Officers.
- Horticulture at the State Fair,
E. W. Randall, Sec'y State Agri. Society.
- The State Horticultural Society and the
District School,
Prof. Wm. Robertson,
University Farm School.
- Is it Practicable to Teach Horticulture in
the Common Schools and How?
Prof. W. W. Pendergast,
State Supt. of Schools.
- Report of committee on nomenclature
and catalogue,
J. S. Harris, LaCrescent.
Prof. S. B. Green, St. Anthony Park.
- Report of committee on vegetables,
H. L. F. Witte, Minneapolis.
Wymen Elliot, Minneapolis.

WEDNESDAY EVENING SESSION—

Continued.

- Forestry and the Water Problem,
J. O. Barrett, Sec'y Minn. Forestry Ass'n.
- Report of committee on deciduous trees
and shrubs.
S. D. Richardson, Winnebago City.
Thos. Harrison, Blanchard, N. D.
F. H. Nutter, 701 Sykes Blk., Minneapolis.
- Practical Thoughts on Growing Shade
Trees,
Wymen Elliot, Minneapolis.
- Nut Culture in Minnesota,
H. S. Fairchild, St. Paul.
- Report of committee on evergreens.
Mrs. J. W. Blackwell, Fort Totten, N. D.
A. K. Bush, Dover.
- To double our membership only re-
quires that each member secure just one
new member. Will you do your part?

THURSDAY EVENING SESSION.

7:30 o'clock.

General Subject—Committee Reports and Program by the University Farm School.

Report of committee on apiculture.

Reading Queen Bees:

Wm. Urie, Minneapolis.

E. K. Jaques, Crystal.

A. S. Lovett, 1811 1st av. S., Minneapolis.

Report of committee on cooking and pantry stores.

Mrs. J. W. Kennedy, Lake City.

Mrs. Wm. Danforth, Red Wing.

Mrs. P. A. Thayer, Sauk Rapids.

Report of committee on ornithology.

Prof. Otto Luzzger, St. Anthony Park.

J. S. Harris, La Crescent.

Report of committee on entomology.

Chas. L. Hill, Albert Lea.

Dewain Cook, Windom.

Program by the University Farm School.

Root-Grafting the Apple,

Chas. A. Andrews.

Marketing Vegetables and Fruit.

J. V. Bailey.

Horticulture and Industrial Employment at the St. Cloud Reformatory,

S. R. Houlton.

THURSDAY EVENING SESSION—

Continued.

Gardening in the Jersey Islands,

E. W. Major.

Forestry as an Employment,

A. E. Stene.

Orchard Practices in Washington as Applicable to Minnesota,

H. E. Burnley, Zillah, Wash.

Buying and Selling Nursery Stock,

Wm. Newman, Albert Lea.

How to Cross Plants—Illustrated by stereopticon,

R. S. Mackintosh.

Prof. S. B. Green's Picture Gallery.

Unfinished business.

Report of committee on obituaries and final resolutions.

9:30 P. M.—Two minute speeches by the members.

9:45 P. M.—Closing remarks by the president.

Invite your friends to take advantage of the reduced rate and attend the annual meeting.

PREMIUM LIST.

All exhibits must be entered with the secretary and in place the first day of the meeting to be entitled to compete for premiums.

Exhibitors competing must be members of this society and the growers or makers of the articles exhibited. The articles exhibited must have been grown in Minnesota or manufactured from Minnesota grown products.

Each exhibit of fruit must consist of four specimens, except when otherwise noted.

No premium will be awarded on unworthy exhibits.

APPLES AND CRABS.

	3d.	1st.	2d.
Prem.	Prem.	Prem.	Prem.
Collection.....	\$3.00	\$8.00	\$5.00
Each variety exhibited included in the fruit list of this society for 1894.....		1.00	.50
Each variety exhibited not included in above mentioned list.....		.50	.25
Seedling apple never before exhibited.....		3.00	2.00

GRAPES.

	5.00	3.00
	1.00	.50
	.50	.25

PLANTS IN POTS.

Collection of ornamental and flowering plants.....	5.00	3.00
Single rose in bloom.....	1.00	.50
Single geranium in bloom.....	1.00	.50
Single begonia in bloom.....	1.00	.50
Single carnation in bloom.....	1.00	.50

CUT FLOWERS.

	5.00	3.00
	2.00	1.00
	2.00	1.00
	2.00	1.00
	2.00	1.00

HONEY.

Collection of comb honey, <i>ad libitum</i>	5.00	3.00
Collection of extracted honey.....	3.00	2.00

Dealers in horticultural implements and appliances are invited to place them on exhibition.

Calendar.

FROM DECEMBER TO MARCH.

J. S. HARRIS.

In the average winter of this state, little out-of-door horticultural work can be done, but the time will not be lost to him who would be an up-to-date horticulturist. Books and papers treating upon his business are cheap and easily obtained. It is the season for the meeting of horticultural societies and clubs, and a favorable time for organizing clubs, societies and reading circles, starting libraries, and making neighborly visits with leading horticulturists, thus filling in the time and utilizing the short days and long evenings of winter in getting a better knowledge of the business.

The careful cultivator will have so improved the past favorable autumn, that his work for this year is virtually finished. He has gathered up all stakes, barrels, boxes, etc. that will be useful for another season, and stored them away where they will be convenient and safe from damage, and made kindling wood of such as are useless. Brush and rubbish that would give an unsightly appearance to the premises and afford harbor and concealment to insects and vermin, have been cleaned up and burned, and the fences and gates are made secure against every contingency, and tools and implements are gathered up and put in a safe place for winter.

If from any cause the work laid out in the November calendar has not been finished up, it should be completed with as little delay as possible. The final covering should be put upon the strawberry beds, and all tender shrubs and plants should be made as safe as possible to endure the most severe winter.

This all being done, yet more remaineth to do.

The orchard and garden should be visited occasionally between the storms of winter, and covering blown off should be replaced; where mounds were not thrown up around young trees, the snow should be kept firmly compacted about them by tramping down after each storm, so that mice may not readily work under it; where snow drifts badly over trees, it should be removed to prevent its breaking them down as it settles, and the feed put out for rabbits should be replenished occasionally.

The farmer's garden is not complete without a hotbed for growing radishes and lettuce and starting early plants of cabbage, cauliflower, tomato, etc. The pit for next spring's hotbed should be dug out this fall and suitably covered to keep out the snow, and the frames and everything else got ready for use at the proper time, and some rich, mellow soil for placing over the manure in it, should be secured and housed, or covered to keep it dry and from freezing.

Most of our orchards need an occasional manuring; winter is the very best time to apply this, and if there is snow upon the ground, so that the hauling can be done on sleds, all the better. Always spread manure in the orchard as it is hauled, and be careful and not pile it around the trunks of trees.

Every one who possibly can should plan to attend some of the horticultural meetings and farmers' institutes that are held during the winter, and the meeting of the State Horticultural Society, if possible. If it is out of the question to attend the meeting, the next best thing to do is to secure a membership in the society, or, if already a member whose time is just out, *renew promptly*, and get the most of the benefit of the meeting later in the monthly magazine and other publications of the society. There is room on the roll of the society for your name and the names of all your neighbors that you can get interested in the work.

Enterprising nurserymen will now have their agents out canvassing for orders for trees to be delivered for spring planting. Snide concerns and foreign jobbers also have their agents out on the same errand. We should never be hasty about placing our orders, but remember that the home nursery is always the safest to deal with, and that in the nurseries located within the state or near its borders the best adapted varieties are most likely to be grown, and that they are able to supply all our wants; also that the local nurseryman knows better than do strangers what varieties will succeed best here. Take time before you order to make sure that the agent you propose to patronize represents a reliable home nursery located near by, or else correspond with and order direct from the nursery. We believe in ordering early, but you will not get left even if you take time to make all necessary investigations.

VARIOUS MATTERS.

The early caught rabbit makes the best pot-pie.

Cellars where vegetables are stored need to be kept cool, else roots will shrivel or start into growth; but they must also be guarded against frost.

Scions are better for being cut early.

Root-grafting may be done any time between now and March. As soon as grafted, the roots should be placed in boxes of earth and kept in the cellar until spring. Every variety should be correctly labeled.

When walking through the orchard on sunshiny days, if the eggs of tent caterpillars are seen on the end of twigs, destroy them at once.

Secretary's Corner.

HARDY CHERRIES.—Prof. N. E. Hansen writes under date of Oct. 28, 1896, "Last week I received a lot of cherry pits from Moscow, Russia, of the hardiest known cherry on earth; and they come true to seed."

AHEAD OF TIME.—The December number is issued a little ahead of time to give the printers an opportunity to bind up a quantity of the completed reports for 1896 in time for distribution at the annual meeting.

MINNESOTA STATE FORESTRY ASSOCIATION.—This society holds its annual session January 12, 1897. Secretary Barrett is now at work on the program, and promises one as diversified and interesting as that of last year.

NORTHEAST IOWA HORTICULTURAL SOCIETY.—The annual meeting of this sister association will be held at Osage, December 15 and 16. Mr. F. W. Kimball, of Austin, will represent our society on that occasion and report duly.

SPRAYING BY STEAM POWER.—In the Brooklyn parks the large shade trees are being sprayed with insecticides through the agency of a portable steam pump, and by this means they are enabled easily to protect the tallest trees from the ravages of insects.

WISCONSIN HAS SOME LARGE APPLES, TOO.—In his report of the fruit exhibit at the Wisconsin state fair, Secretary Philips refers to the increased size of apples raised on clay limestone soil, and speaks of a Wolf River weighing twenty ounces and a McMahon, eighteen ounces.

OUR PROGRAM.—The program of our annual meeting, in accordance with requirements of our constitution, was mailed Saturday the 14th, to all our members and others interested. It would be well to preserve it and bring to the annual meeting, which of course you will not fail to attend.

ANNUAL MEETING IOWA STATE HORTICULTURAL SOCIETY.—Our sister society will hold its annual session in their rooms at the Capitol, in Des Moines, Dec. 8th. J. P. Andrews, of Faribault, has consented to represent our association on that occasion, and his report of the meeting will appear in the January number.

PENINSULA HORTICULTURAL SOCIETY.—Maryland, Delaware, and a part of Virginia have united their horticultural interests under the above name, and at present Hon. H. E. Van Deman is president of the society. In a recent letter he says, "Remember me to your members when the next annual meeting occurs."

JUST LIKE US.—After describing the extraordinary fruit exhibit this fall at the Wisconsin state fair, Secretary Philips says: "It is evident that if our horticultural exhibits continue to increase as they have in recent years, the quarters assigned us will soon be too small, and an addition will have to be built on the north end of the hall."

GO TO THE NORTHEASTERN IOWA MEETING.—Mr. C. F. Gardner, of Osage, Iowa, writes that the Northeastern Society, of which he is vice-president, is to meet December 15th in the city where he lives, and that free entertainment is to be given to all visitors. He hopes for a number from our state. Our members in the southern part of the state will find that a convenient place to reach, and the meeting is sure to be a good one.

WHY WE STUMBLLED.—More blunders than usual found lodgment in the November number, and one or two in the Secretary's Corner were very unwelcome. We don't know how to account for it, except because this country elects a president every four years. When platforms occupy Elder Stewart's beautiful park directly opposite our window, and brass bands, negro melodies and excited speeches to roaringly responsive crowds "occupy" the atmosphere, proof reading is a very uncertain pursuit. Things are different now, and we may find it hard to think of so good an excuse for the next occasion.

DON'T PAINT YOUR WATER TANK INSIDE.—A member from whom we expected a report of the result of his experiments in irrigation this year, has been unable to use his system, because he painted his wooden tank *inside* as well as outside. The staves shrunk some before he was ready to fill it, and when the water was turned on it continued to leak, as the water could not soak through the paint and swell the wood to water tightness; nor could the hoops be drawn down tight enough to stop the leakage. The paint inside must evidently be scraped off before the tank will be serviceable.

DELEGATE FROM IOWA.—President F. M. Powell, of the Iowa State Horticultural Society, writes me that Mr. Jerry Sexton is to represent their society at our annual meeting, and will probably bring some samples of fruit with him. Mr. Sexton will be remembered as the gentleman who presided over the fine collection of Russian apples which the Iowa Agricultural College generously contributed to our late state fair. He has had special opportunities as Prof. J. L. Budd's assistant to familiarize himself with Russian apples, and his presence with us is very opportune. It will be remembered that we are holding in cold storage a large part of the Iowa display for this occasion.

LAW VS. PLANT DISEASES.—Twelve states now have laws against contagious diseases affecting fruit trees, in most cases against peach yellows and black knot, though in California, Washington and New Jersey the law is a general one. In New Jersey, the officers of the State Experiment Station, on the discovery of a new fungus

growth confined to small area, are authorized arbitrarily to destroy the plants so affected, certifying to the owners the amount of damage to them from this destruction, which is refunded by the state.

In the case of similar laws affecting nursery stock, there is a general feeling on the part of nurserymen outside the state affected that the ulterior purpose is to retain business for the local nurserymen. Probably this is not the case, but the inference is natural.

BISULPHURET OF CARBON FOR BORERS.—"All the smaller trees of the parks are examined carefully, and when a burrow is found bisulphuret of carbon is injected into it and the burrow closed with putty or soap. We often find as many as a dozen or more borers in the trunk and branches of a small elm or maple from four to six inches in diameter, and these are easily treated with the bisulphuret of carbon, which is sure death to any living thing in the burrow. I have also found it a most effectual remedy for the apple tree borer and all borers of fruit trees where the burrows can be found; they are often very prominently marked by the frass these borers eject from their burrows. Take a common oil can with a spring bottom, and the liquid can be forced from it into the burrows without difficulty."—*Rep. 1895, Mass. Hort. Society.*

MEADOW VALE HORTICULTURAL SOCIETY.

A. W. KEAYS, SEC'Y, ELK RIVER.

This society, located at Elk River, was organized October 31st, and the annual meeting is to be held on each recurring anniversary of that day, the last Saturday in October. The officers for the ensuing year are:

President, Chas. A. Hill; vice-president, E. G. Bailey; secretary, A. W. Keays; treasurer, F. E. Engbretson; librarian, H. C. Bailey; executive board, Geo. Keasling, Hiram Bailey, Mrs. J. S. Mills.

The next monthly meeting will be held November 21st. This society will affiliate with the state society. All who are interested in fruit culture, or wishing to be enrolled in this society, will correspond with the secretary. All members have a free use of the library. List of members up to date:

F. E. ENGBRETSON.

H. C. KEAYS.

MRS. J. S. MILLS.

HIRAM BAILEY.

MRS. A. W. KEAYS.

A. C. BAILEY.

FLORENCE R. HILL.

EMILY A. BAILEY.

CHAS. A. HILL.

E. G. BAILEY.

A. W. KEAYS.

MRS. KATE G. FRISBEE.

H. C. BAILEY.

GEO. C. HILL.

GEO. KEASLING.

A. ENGBRETSEN.

J. HEATH.

ERASTUS MORGAN.

R. J. HEATH.

H. N. BLAISDELL.

ALBERT HEATH.

JOHN P. FRISBEE.

C. W. PAGE.

J. M. GREENSTREET.

(Mr. Keays, the secretary, speaks very encouragingly of the prospects of their society. They start out with a library, to which we are to contribute a file of reports. A library is a *very essential* factor to the success of a local society. Sec'y.)

Annual Meeting, Dec., 1895.

JOURNAL OF TWENTY-NINTH ANNUAL MEETING OF THE MINNESOTA STATE HORTICULTURAL SOCIETY, HELD IN MINNEAPOLIS, MINN., DEC. 3, 4 AND 5, 1895.

The meeting was called to order at 10 o'clock a. m., Tuesday, December 3d, 1895, by President J. M. Underwood, in the rooms of the County Commissioners in the new court-house.

President Underwood opened the convention with the following remarks:

Ladies and Gentlemen of the State Horticultural Society:—The hour for holding the twenty-ninth session of this society has arrived. It gives me great pleasure to welcome you all here this morning, this bright, bracing winter morning, when I feel that we must have become imbued with the same spirit as we are favored with in such a bracing and glorious atmosphere as greets us this morning.

There is no doubt but that in order to accomplish the greatest amount of good in this world we have to be organized into bodies representing the interests we are seeking to serve, and in order to best further the interests of horticulture in the state of Minnesota it was considered fitting and proper that this society should be formed, twenty-nine years ago. The history of this society is familiar to you all. Year after year we have met in annual session, as well as in our summer meetings, and a great amount of interest has been developed and much good has been accomplished. I have no doubt that this meeting will be fully as interesting, or more so than any we have had. The surroundings under which we are placed are of such a character as to stimulate us to our best efforts and bring out our best thoughts, and I shall hope for great good to result from the meeting which we are now about to hold.

I wish to say as presiding officer that there is no formality in the holding of our sessions, except that we read the various

reports and papers that are to be presented or deliver the speeches that are to be made, and that we want every one to feel perfectly free to discuss these reports, or whatever they may be. We like spirited ideas and spirited discussions, and we want every one, whether he is a paid member of the society or not, if he is in the room and has a thought in the line of horticulture or the subject under discussion, we want him to feel at perfect liberty and welcome to make his thought known. I hope each will vie with the other in bringing out the best thoughts there are along the lines of discussion which are presented during the progress of this meeting.

The first item on the program is the appointment of the committee on credentials. I will appoint as such committee Mr. C. L. Smith and Mr. R. S. Mackintosh.

The next is the report of the committee on small fruits. I will call on Mr. W. J. Hopkins, of Bloomington.

Mr. Hopkins: I have a paper; it is not in the nature of a report. It is a paper on the culture of the blackcap raspberry from a business standpoint.

Mr. Hopkins then proceeded to read, "The Culture of the Blackcap Raspberry." (See index.)

An interesting discussion followed.

Pres. Underwood: We have with us Mr. R. J. Coe, of Ft. Atkinson, Wis., who will speak to us on strawberry culture. Let us have these papers read and then have the discussion so as to keep up with the program.

Mr. Coe (Wisconsin): I will not attempt anything in the line of the general culture of strawberries, but I will only tell you of our practice in growing strawberries.

"Strawberry Culture." R. J. Coe, Ft. Atkinson, Wisconsin. (See index.)

A long discussion ensued.

Mr. R. S. Mackintosh then read the following paper:

"Anthracnose of the Raspberry," R. S. Mackintosh, St. Anthony Park. (See index.)

Pres. Underwood: I think now to keep up with our program I will ask Mr. C. L. Smith to talk to us about small fruits.

Mr. Smith then spoke in an interesting way on "Hints about Small Fruits," and a discussion followed. (See index.)

Pres. Underwood: The time has come for us to adjourn the morning session. We will take up this topic again at the beginning of the afternoon session. We will now stand adjourned until 2 o'clock.

AFTERNOON SESSION.

TUESDAY, December 3d.

Pres. Underwood: There is a great deal to interest fruit growers in looking over the exhibit, and I do not see any way but to go on with the meeting with those who are interested in the discussion of papers and trust to the members in the other room coming in as they feel disposed. We would like to finish up this forenoon's program with the discussion of Mr. Mackintosh's paper on "Anthracnose."

Here followed a discussion on this paper. (See index.)

Pres. Underwood: We will next listen to the report of the committee on grapes.

E. J. Cutts, Howard Lake, then submitted the following report on grapes: (See index.)

The usual discussion ensued.

Pres. Underwood: We will next listen to a paper by Mr. C. W. Sampson.

"A Delaware Vineyard," C. W. Sampson, Eureka. (See index.)

This was also well discussed.

Pres. Underwood: The committee on credentials is now ready to report.

Mr. Smith: Your committee has to report that Mr. A. F. Collman, of the Iowa State Horticultural Society, Prof. N. E. Hansen, of the South Dakota State Horticultural Society, and Mr. R. J. Coe, of the Wisconsin State Horticultural Society, have proper credentials as representatives of their respective societies to this meeting, and the committee recommends that they be made honorary members of this society for one year.

On motion of Mr. Cutts, the recommendation of the committee was unanimously adopted.

Pres. Underwood: We are very glad to welcome Mr. Collman, Mr. Coe and Prof. Hansen, and hope they will feel perfectly at home here and feel free to participate in our discussions.

Mr. Collman (Iowa): I thank you for your kind reception, and hope you will send us a good man to meet with us next week at Des Moines. We shall use him kindly and be glad to exchange notes.

Mr. Coe (Wisconsin): I do not know that I need say anything in response to your kind welcome, except to thank you and say that I have always been kindly received.

Prof. Hansen (South Dakota): I was here two years ago and had a very nice time, and I came over to learn some more. I see you have some very nice apples in the other room. I hope you will send a delegate to South Dakota to our next meeting. We will not have a meeting this winter, but we will next winter sure.

Pres. Underwood: The next item on the program is the report of the committee on plums and cherries.

Mr. Dewain Cook, Windom, then presented the following report on plums and cherries: (See index.)

This evoked an interesting discussion.

Secretary Latham then read the following paper descriptive of a new sand cherry:

"The New Hybrid Sand Cherry," H. Knudson, Springfield. (See index.)

Mr. J. S. Harris then presented the annual report of the committee on seedling fruits, which was followed by a long and interesting discussion. (See index.)

Pres. Underwood: We will now listen to a paper by Mr. Cook on plums.

"Plums as a Source of Profit," Dewain Cook, Windom. (See index.)

Pres. Underwood: The next topic on the program is the report of the committee on apples, J. P. Andrews, Faribault. (See index.)

A lively discussion ensued.

Pres. Underwood: It is now about 5 o'clock, and we thought it better to adjourn now. We could take up the discussion again in the morning, or continue it now, just as you choose. There is one more topic on this afternoon's program, and if there is no objection the secretary will read a paper by Mr. Bullis.

"My Orchard—What I have Found and Lost in it," O. H. Bullis, Winnebago City. (See index.)

Pres. Underwood then announced the appointment of the following judges and committees:

Judges:

Apples: J. P. Andrews and S. D. Richardson.

Grapes: E. J. Cutts.

Peaches and Pears: A. F. Collman.

Vegetables: J. S. Harris.

Flowers: Mrs. Jennie Stager.

Honey: C. Thielmann.

Committee on President's Address: Wyman Elliot, C. W. Sampson and C. L. Smith.

Committee on Obituaries: J. S. Harris.

Committee on Final Resolutions: L. R. Moyer, F. H. Nutter and A. H. Brackett.

On motion of Mr. C. L. Smith, the meeting adjourned to 7:30 P. M.

EVENING SESSION.

TUESDAY, December 3d.

The meeting was called to order at 8 o'clock, by President Underwood.

Pres. Underwood: The first thing on our program this evening is the president's address, and it seemed to me in our society it would be a great deal better to give up that part and let the members do the talking, and let them really furnish the president's address, and only furnish the recommendations that might be expected to come from my office in the interests of the society. I have always tried, at least for a good many years, to see how much work I could get out of other people. In fact, it is the study of my life to see how much responsibility I can shirk and put on the shoulders of others, and how well I can recompense them for doing the work. I do not want, however, to appear to be either unwilling or wholly incompetent to fill out the program, and when the secretary wrote me and sent me a draft of the proposed program, as he did the other members of the executive board I told him to leave out the president's address. He did not obey my orders, and so I suppose I must say something to you in the nature of an address this evening.

President Underwood then delivered the following annual address: (See index.)

Press. Underwood: The next thing on the program is the annual report of the executive board.

Mr. Elliot: I hope the members will forgive me for not making a report in detail of all that has been done during the year by the executive board. There are some things that we are happy to leave out and cover; let them be buried in oblivion. There are others that we are glad to call your attention to.

Mr. Wyman Elliot, as chairman of the executive board, then submitted the following report: (See index.)

The secretary, Mr. A. W. Latham, submitted the following annual report: (See index.)

The annual report of the treasurer, Mr. F. G. Gould, was then read by secretary Latham, as follows: (See index.)

Pres. Underwood: The next on our program is the report of the committee on legislation.

Mr. Elliot: The secretary has gone into that in detail, and I do not think I can add anything to it. All I can say is that we started in to obtain something, and we obtained what we started in for, and it has put our society in a great deal better condition than it has ever been in before.

Pres. Underwood: We will now listen to the report of the delegate to the Northeastern Iowa Horticultural Society, Mr. O. M. Lord, of Minnesota City.

Mr. Lord: I feel somewhat handicapped in this report by the statement of the secretary that you would expect a good one. I do not know what earthly reason he had for making such a statement. If I render a correct report of the meeting I shall certainly make a good one; at least I was greatly interested in it. Judging from the papers that were read here today they certainly have the merit of brevity, and I fear I shall trespass on your time. If my paper is too long, I want you to step on my toes.

Mr. Lord then submitted the following report, which was received with unstinted applause: (See index.)

Pres. Underwood: We will now listen to an address by Prof. Hansen, of Brookings, South Dakota, on "Notes on European Horticulture." (See index.)

A brief discussion ensued.

Pres. Underwood: We have another paper on the program this evening, and I will call on Prof. Brewster.

"The Ideal Horticulturist." Prof. H. W. Brewster, St. Anthony Park. (See index.)

Pres. Underwood: Ladies and gentlemen, this concludes our program for this evening. Tomorrow morning's program begins at 9 o'clock. The general subject is apples. The meeting is now adjourned to 9 o'clock tomorrow morning.

MORNING SESSION.

WEDNESDAY, December 4th.

The meeting was called to order at 9:30 by President Underwood.

Pres. Underwood: The general subject this morning is apples, and the first topic on the program is in regard to top-working the apple. We will hear from Secretary Philips of Wisconsin, on "Top-Working the Apple."

Mr. A. J. Philips, of West Salem, Wis., then spoke as follows: (See index.)

The reading was followed by a long discussion.

Mr. P. V. Collins: A few days ago I was in the Historical Library in St. Paul, and in looking over the old newspaper files, I read an account of the visit of a New York editor to Minnesota. That editor was Horace Greeley. He said that Minnesota was a very fine country, but he would not want to live here because they could never raise apples. That was in 1860. In 1865 he came here again, and the horticultural society, or the horticulturists, had at the place where he was received a large sign painted, on which his previous words were quoted, that we could never raise apples in Minnesota. On a table underneath this sign were one hundred varieties of apples raised in Hennepin county. That shows that newspaper editors do not know much about horticulture. I want to get better acquainted with the people, and at the suggestion of my able partner, my wife, I am here to ask you to an informal reception at our residence this evening. I have arranged with the president to adjourn the meeting at nine o'clock. I want to extend this invitation to every member of the society, and all in attendance, including the ladies and everybody. Leave your "biled" shirt and swallow tail at the hotel, and come as you are. (Applause.)

Pres. Underwood: I thank Mr. Collins very much for his invitation, and without any formality in the matter I will accept Mr. Collins' kind invitation, and we will adjourn our meeting at 9 o'clock this evening. If we are all here promptly at 7 o'clock, we will have time enough to get through our evening session. If there is no objection, we will commence at 7 o'clock instead of half past seven, and that will give us ample time to adjourn at 9 o'clock.

Dr. M. M. Frisselle: We are certainly under obligations to Mr. Collins for this kind invitation, but I do not think he told us the most important part, and that is, where to come.

Mr. Collins: I will be here to conduct you personally.

Mr. Birch then read the following:

"A City Orchard." H. R. Birch, Minneapolis. (See index.)

Prof. Green then read the following report of the excursion made by Mr. Clarence Wedge and himself through the orchards of the state:

"The Orchards of Minnesota in August, 1895." Prof. S. B. Green, St. Anthony Park. (See index.)

The reports of vice-presidents were then presented in their order, as follows:

E. H. S. Dartt, First Congressional District, Owatonna. (See index.)

S. D. Richardson, Second Congressional District, Winnebago City. (See index.)

Mrs. A. A. Kennedy, Third Congressional District, Hutchinson.

Mrs. Kennedy: We did not have fruit enough to pay for writing a report. It was about an entire failure.

J. O. Barrett, Sixth Congressional District, Brown's Valley. (See index.)

Mrs. Jennie Stager, Seventh Congressional District, Sauk Rapids. (See index.)

Pres. Underwood: It is now past 12 o'clock, and perhaps it would be well to adjourn now and take up the balance of the reports after recess. On motion of Mr. Smith the meeting adjourned to 1:30 P. M.

AFTERNOON SESSION.

WEDNESDAY, December 4th.

Pres. Underwood: The meeting will please come to order, and we will resume the morning's program.

The remaining vice-president's reports were then presented.

R. S. Mackintosh, Fourth Congressional District, St. Anthony Park. (See index.)

Col. J. H. Stevens, Fifth Congressional District, Minneapolis. (See index.)

Mr. Harris was then called upon for the following:

"Before and Behind the Scenes," J. S. Harris, La Crescent. (See index.)

Prof. S. B. Green then presented the annual report of the central experiment station, as follows: (See index.)

Mr. A. F. Collman was then called on for the following paper:

"Climatic Modification of Fruits," A. F. Collman, Corning, Iowa. (See index.)

Pres. Underwood: The next topic on the program is a poem by Mrs. S. Irwin, of Excelsior, which the secretary requests me to read.

Pres. Underwood then read the following poem, which evoked much applause: (See index.)

Pres. Underwood: We have another paper here by Mrs. Irwin, which is on the regular program, and as Mrs. Irwin is not present to read it herself the secretary will read it.

"My Fight with the Animal Kingdom," Mrs. Sophronia Irwin, Excelsior. (See index.)

The following reports were next read:

Report of committee on nomenclature and catalogue, J. S. Harris, La Crescent. (See index.)

Report of committee on fruit blossoms, L. R. Moyer, Montevideo. (See index.)

Report of committee on award of premiums—peaches and pears, A. F. Collman, Corning, Iowa. (See index.)

Pres. Underwood: The next paper will be one by Mr. Pearce, which will be read by Mr. Smith.

"Strawberries," M. Pearce, Chowen. (See index.)

This paper was fully discussed.

Mr. Coe: It is necessary that I should leave tonight, and I want to take this opportunity to thank the society for the reception they have given me. I shall take back a report that I hope you will not be ashamed of, and I will give a report that our society shall not be ashamed of.

Pres. Underwood: We are very glad to have had Mr. Coe with us, and hope he will meet with us wherever we may have a session.

It is now 5 o'clock and time to adjourn, and I will declare the meeting adjourned to 7 o'clock this evening.

EVENING SESSION.

WEDNESDAY, December 4th.

Pres. Underwood: There are some here who are interested in the apple question, and I will introduce at this time a paper on grafting, by Mr. John Nordeen. Mr. Nordeen will also illustrate the process of grafting trees.

"Root Grafting," John Nordeen, Lake City. (See index.)

At this point Secretary Latham read a telegram conveying the greetings and congratulations of the Missouri State Horticultural Society to the Minnesota Society.

On motion of Mr. Smith the secretary was authorized to acknowledge receipt of the telegram and send greetings to the Missouri Horticultural Society.

Pres. Underwood: The next topic on our program will be Forestry.

Report on forestry, J. O. Barrett, Brown's Valley. (See index.)

Pres. Underwood: The next paper on the program is one by Mr. Cummins on the black walnut.

"Will it Pay to Grow the Black Walnut?" J. R. Cummins, Washburn. (See index.)

A discussion ensued.

President Underwood: The next topic is forestry, and we will now listen to a paper by Mr. Ayres.

Report of committee on evergreens, H. B. Ayres, Carlton. (See index.)

Pres. Underwood: We have a number of papers on the program this evening that we will be compelled to omit for want of time. Mr. Nutter has very kindly consented to give his paper on "Landscape Gardening" tomorrow forenoon. I consider it a very important paper and one that I know you will all be interested in.

The next topic on the program is the report of the committee on floriculture.

Report of committee on house and greenhouse plants, Aug. S. Swanson, Endicott Arcade, St. Paul. (See index.)

Mr. Elliot: I have a letter here from Dr. Folwell, acting president of the state university, inviting the society to hold its session tomorrow at the university.

On motion of Mr. Moyer, it was decided to visit the university on Friday morning.

MORNING SESSION.

THURSDAY, December 5th.

Pres. Underwood: The first thing this morning we will take up and finish yesterday evening's program. We will now listen to a report on deciduous trees and shrubs by Wm. Somerville, Viola. (See index.)

Pres. Underwood: We have with us this morning Mr. C. F. Gardner, of Osage, Iowa, who is here as a delegate from the Northeastern Iowa Horticultural Association. He came in last evening, and I take great pleasure in introducing him to you this morning. I know he feels at home here; he has met with us before.

Mr. Gardner, (Iowa): *Mr. President, Ladies and Gentlemen of the Minnesota State Horticultural Society:* It gives me great pleasure to be with you again. I attended your meeting last winter at Lake City, as a delegate from the Iowa society, and our state society meets next week at Des Moines, and I have my report of my trip to Lake City to make, and I assure you that I shall not say anything in that report that will hurt any one in Minnesota. We had a splendid time at the last meeting, and I should judge from appearances that you are all enjoying yourselves and learning a great many new things at this meeting. I will not take up your time any further at present, but I shall feel at home to make a few remarks as occasion presents itself during your meeting.

The report of the fruit list committee was then made by Mr. Clarence Wedge. After a thorough discussion and some amendments, it was adopted. (See index.)

Pres. Underwood: We have with us this morning some of the leading commission men of Minneapolis. Mr. Corbett, one of the commission men of Minneapolis, talked with me in regard to the interest, the mutual interest, that existed between the fruit growers of the state and the commission men, and suggested the idea that the commission men would like to affiliate with us and become acquainted with us, and also take part in our deliberations, and I extended an invitation to the commission men to meet with us this morning, and asked Mr. Corbett to say something to us, and we should also be glad to hear from the other gentlemen who are present with us this morning.

Long and interesting talks followed from the commission merchants and others.

(See index under "Commission Merchants.")

At this point an intermission of ten minutes was taken for the purpose of permitting the members to become acquainted with the commission men present.

Pres. Underwood: We will now resume our program. We have an interesting paper on landscape gardening in the country.

"The Landscape Gardener in the Country," F. H. Nutter, Minneapolis. (See index.)

Pres. Underwood: It is always a great pleasure to have our friend Prof. Pendergast meet with us, and unless he is to remain with us during the afternoon session, I wish he would take some time to give us some words of encouragement before we close our morning session.

Prof. W. W. Pendergast proceeded to speak of his observations in Washington on the subject of irrigation. (See index.)

Pres. Underwood: As the hour has now come for our noon adjournment, I wish to say that there is some one prepared to take a photograph of the members of this society, and they are requested to gather on the west steps of the court-house as they pass out.

The meeting now stands adjourned to 1:30 this afternoon.

AFTERNOON SESSION.

THURSDAY, December 5th.

Pres. Underwood: We will now listen to a report on the horticultural exhibit at the state fair.

"Our Exhibit at the State Fair," Wm. Somerville, Viola. (See index.)

An interesting discussion ensued, after which the resolutions it contained were adopted.

Mr. J. W. Murray: I think the secretary of our society should be requested to have the leaves of our magazine trimmed. Most of us are old, and life is too short for us to stop to cut the leaves, and I move therefore that the secretary be instructed to have the leaves of future magazines trimmed.

The motion, being put to a vote, unanimously prevailed.

Pres. Underwood: We have a paper here on irrigation, by Mr. Danforth, of Red Wing, and Prof. Green also has a paper on irrigation. We will have these papers read, and then take up the subject of irrigation for discussion. We will first have the report of the committee on irrigation, by Prof. Green.

Prof. S. B. Green: We would like to have the delegates visit the school of agriculture tomorrow afternoon, and we will have it so arranged. We would be pleased to invite you out there to dinner tomorrow, and I think we can take care of all that will come. Unless you hear from me further, we will have carriages at Cromwell avenue to meet the visiting delegates and members, and carry you up to the school. We would be glad to have you all come and visit us.

The paper I have to present on irrigation is not in the nature of a report at all. It is a little paper I had prepared for my class. I did not have time to draw up a report. The secretary wished me to present this.

Prof. S. B. Green then read his report on irrigation. (See index.)

Pres. Underwood: We will now listen to a paper by Mr. Danforth. This paper was written by Mr. William Danforth, but as he is unable to be present on account of sickness, the paper will be read by his son.

"My Artesian Well." Wm. Danforth, Red Wing. (See index.)

A short discussion ensued.

Pres. Underwood: We have another paper here on irrigation by Mr. Geo. Whiting, of Yankton, S. D., which I will ask the secretary to read.

"Irrigation with Reservoir," Geo. W. Whiting, Yankton, S. D. (See index).

Mr. F. W. Kimball: I move that our secretary be instructed to return the thanks of the society to Mr. Whiting for his able and instructive paper, and that he be made a member of this society for the ensuing year.

The question being put to a vote, the motion unanimously prevailed.

Pres. Underwood: The time has now come for the annual election of officers. I will appoint as tellers Mr. C. W. Sampson and Mr. A. H. Brackett: (For result of this election see index).

Col. Stevens: I move that Mr. Amasa Stewart be put on the roll of life membership of this society. He performed valuable service until ill health compelled him to leave the country, but even to this day he has taken a great interest in the society. He has done much for the horticulture of this state. He lives now in Texas. I had a letter from him today, and he sends his regards and best wishes to the members of this society. All the old members know him very well.

Mr. Harris: Mr. Stewart was a very active member of this society long ago when the society was a weak little waif, and he will always be remembered for his currant bush.

On motion of Mr. Elliot the matter was referred to the executive board to report their recommendation to the society later.

Pres. Underwood: We will now take up the subject of vegetables. As none of the committee on vegetables are present or ready with a report, we will listen to a paper by Mr. White.

"Cabbages in the Market Garden." J. W. White, Minneapolis: (See index.)

We will now have an interesting paper by Mr. Lord on the subject of peaches.

"How I Grow Peaches." O. M. Lord, Minnesota City. (See index.)

A long discussion followed.

Pres. Underwood: This discussion is very interesting, but it is time to adjourn our meeting. We will now stand adjourned till 7:30 this evening.

EVENING SESSION.

THURSDAY, December 5th.

Pres. Underwood: I will appoint as a committee, to act with the president, to meet the State Agricultural Society in regard to the premium list: Messrs. A. W. Latham, C. L. Smith and C. W. Sampson.

Pres. Underwood: We have received a letter from Mrs. Dorilus Morrison, which I will read:

To the President or Secretary of the Minnesota Horticultural Society:
MY DEAR SIR.—As illness unfortunately prevents the pleasure I hoped to have of attending your interesting session this year and listening to the bright papers given there, permit me to send, through you, our very cordial greeting to the members of the horticultural society of our state, with the request that they give Mr. Morrison and myself the pleasure of holding the annual summer picnic (coming in 1896) with us, at *Villa Rosa*.

With hearty good wishes for the prosperity of all, and congratulations upon the progress and achievements of the society, I have the honor to remain,

Very cordially yours,

MRS. DORILUS MORRISON.

Villa Rosa, December 5th, 1895.

Mr. Elliot: I move this communication from Mrs. Morrison be referred to the executive committee to take action at some future time. We do not want to say now that we will meet there for our summer meeting, because something may happen to disappoint us and prevent us from accepting the invitation, and I think for that reason it had better be referred to the executive committee, and the secretary can acknowledge receipt of the invitation in a suitable manner.

A vote being taken on the question, the communication was so referred.

Pres. Underwood: We have a few questions in the question box which we will take up at this time. (See index.)

Pres. Underwood: We will now take up the report of Mrs. Harry Snyder on cooking and pantry stores.

Report of committee on cooking and pantry stores. Mrs. Harry Snyder, St. Anthony Park. (See index.)

Pres. Underwood: There are some other committees to report, but as the hour is getting late it is for you to say whether we shall hear them or not.

Mr. Harris: As one member of the committee on entomology, I will hand in my report to the secretary for publication instead of reading it.

Pres. Underwood: Is there any unfinished business?

The motion by Col. Stevens to place Mr. A. Stewart, of Texas, on the list of life members was favorably recommended by the executive board, and, on motion of Mr. E. H. S. Dartt, the recommendation of the board was adopted.

On motion of Mr. Elliot, Mr. E. H. S. Dartt was appointed delegate to the meeting of the Wisconsin State Horticultural Society.

Mr. Collman, (Iowa): Before we adjourn I wish to thank the members of this society for the kind treatment I have received, and I hope you will send us a delegate, and we will endeavor to use him just as well as you have used me. I will endeavor to report this meeting to our society in a way that will merit your favor and do our society good.

On motion of Mr. Elliot, Mr. S. D. Richardson was appointed delegate to the Iowa State Horticultural Society.

Pres. Underwood: There is one other organization that meets on the same day as the Iowa society, and that is our State Agricultural Society. They meet at the capitol building in St. Paul, at 10 o'clock, January 14th, and I wish every member would see that there is a delegate appointed from his

county to that meeting. I think we owe it to our horticultural society to have a full representation there.

The committee on final resolutions, through its chairman, L. R. Moyer, submitted the following report:

To the Minnesota Horticultural Society:

Your committee on resolutions, at this, the closing session of our annual meeting, would respectfully submit the following preamble and resolutions:

In recognition of the fact that we have been privileged to enjoy a most harmonious and profitable meeting, we, the members of the Minnesota State Horticultural Society, before we separate, do resolve as follows:

First. We would extend to sister societies and kindred organizations in neighboring states, who have been represented at this meeting by delegates, or otherwise, our cordial greeting and hearty good wishes.

Second. We wish to express to the worthy chairman of the executive board our thanks for his successful efforts to secure for our society increased appropriations at the last session of the state legislature.

Third. While it is difficult to record and acknowledge all the kindly favors which have contributed to the success of this meeting, we wish to express our special thanks to the commissioners of Hennepin county, for the use of this most pleasant and convenient suite of rooms; to the janitor and other employees of the building for their kindly services; to the daily press of the city for the extended and reliable reports which they have given of our sessions; to Mr. and Mrs. P. V. Collins for the generous hospitality received at their home; and to Prof. S. B. Green and Prof. Lugger, for the "Lantern Talk," and "Scientific Talk," with which they have just favored us, in which art, science and instruction were so happily blended.

Fourth. Believing it to be the duty of those in authority to preserve for future generations such tracts of land as by their natural beauties, historical associations or relations to our water supplies, seem to be especially adapted for public scenic parks or forest reservations, we do express our hearty approval of what the state has done in that direction, especially in its endeavors to preserve the beautiful scenery and wonderful natural curiosities at the Dalles of the St. Croix, and to express our hope that our sister state of Wisconsin will speedily co-operate with Minnesota by securing the necessary land on the easterly side of the river, that the proposed 'Inter-State Park' may be one that we shall all be proud of.

Respectfully submitted,

L. R. MOYER,

A. H. BRACKETT,

FRANK H. NUTTER,

Committee.

On motion of Mr. J. S. Harris, the report of the committee was adopted.

On motion of Mr. Wyman Elliot, the annual meeting was declared adjourned sine die.

RECORD OF MEETINGS OF THE EXECUTIVE BOARD FOR 1896.

Meeting held at the secretary's office, at 1 P. M., December 3, 1895.

All the members, except Prof. S. B. Green, were in attendance.

The secretary's books were examined and his bill for office expenditures, amounting to \$194.70, was audited.

Adjourned *sine die*.

A. W. LATHAM, .	WYMAN ELLIOT,
Secretary.	Chairman Executive Board.

Meeting held at 6 P. M., Dec. 6, 1895, at the Minneapolis court-house, all the members being in attendance.

Wyman Elliot was elected chairman of the board for the ensuing year.

A. W. Latham was elected secretary for the ensuing year, and his salary fixed at eight hundred dollars (\$800) per annum.

The secretary's bond was fixed at \$1,000 and the treasurer's bond at \$2,000.

The salaries of the president and treasurer for the ensuing year were fixed at \$25 each.

Messrs. Elliot, Latham and Green were appointed to select the standing committees for the year.

The following bills were audited and allowed:

J. M. Underwood, president's salary for 1895.....	\$25.00
F. G. Gould, treasurer's salary for one-half of 1895.....	12.50
J. S. Harris, expenses of executive board.....	17.50
L. R. Moyer, " " " 	5.35
J. P. Andrews, " " " 	2.00
J. M. Underwood, " " " 	3.00
O. M. Lord, expenses as delegate to Northeastern Iowa Horticultural Society.....	15.29
S. B. Green, expenses of lantern, etc., for entertainment,	6.00
E. A. Cuzner, salary and expenses as assistant librarian, 1895.....	11.65
Dewain Cook, expenses as experiment station superintendent.....	5.64

Amasa Stewart, of Lemarque, Tex., was unanimously recommended to the society as an honorary life member.

An appropriation of \$25 was made to purchase books for the library, the recommendation for the same to be submitted to the board.

Adjourned *sine die*.

A. W. LATHAM,
Secretary.

WYMAN ELLIOT,
Chairman Executive Board.

Meeting held at the Minneapolis court-house, 9 a. m., Dec. 6, 1895.

Present, Messrs. Elliot, Underwood, Harris, and Latham.

The treasurer's books for 1895 were examined and found correct.

The following bills were audited and ordered paid:

A. W. Latham, premiums paid at annual meeting Dec. 5, 1895.....	\$146.00
J. O. Barrett, expenses as vice-president.....	7.73
S. D. Richardson, " " ".....	4.65
Mrs. Jennie Stager " " ".....	2.67
Mrs. A. A. Kennedy, " " ".....	2.50

Adjourned *sine die*.

A. W. LATHAM,
Secretary.

WYMAN ELLIOT,
Chairman Executive Board.

Meeting held at drill hall, Minnesota State Experiment Station, June 19, 1896.

The following members were in attendance: Chairman Wyman Elliot, Pres. J. M. Underwood, Messrs. J. S. Harris, J. P. Andrews, Clarence Wedge and Sec. A. W. Latham.

On motion of J. M. Underwood, A. H. Brackett, of Long Lake, was appointed treasurer to fill the unexpired term caused by the death of F. G. Gould.

Messrs. Wyman Elliot and J. S. Harris were appointed a committee to audit the semi-annual account of the secretary and the bill of the stenographer connected with reporting the summer meeting of 1896.

A committee consisting of the president, secretary and chairman of the executive board was appointed with full authority to act in relation to any matters referred to in the resolution of D. R. McGinnis, adopted by the summer meeting of 1896, as to legislation in the interests of forest protection.

Adjourned to meet at the Minnesota State Fair Grounds, Thursday, Sept. 3, 1896.

A. W. LATHAM,
Secretary.

WYMAN ELLIOT,
Chairman Executive Board.

Meeting held at the Minnesota State Fair Grounds, Thursday, Sept. 3, 1896.

Pursuant to adjournment, the board met at the horticultural department, Agricultural Building, Minnesota State Fair Grounds, at 3 p. m., Sept. 3, 1896.

All the members were present except Prof. S. B. Green.

It was decided to change the name of the "experiment stations" of the society and hereafter call them "trial stations," to avoid confusing them with the state experiment stations.

The premium list for the next annual meeting being under consideration, it was decided to leave out the premiums on vegetables, on account of the lack of room for the display.

The next annual meeting is to be held in Minneapolis, unless later developments make it desirable to convene elsewhere.

The secretary was instructed to prepare the program for the annual meeting after conference with the members of the board, and when prepared submit it to them for approval.

The following bills were audited and allowed:

Estate of F. G. Gould, for treasurer's fees, etc.....	\$14.00
Clarence Wedge, expenses of ex. board.....	9.75
J. S. Harris, " " "	10.45
L. R. Moyer, " " "	4.05

Adjourned *sine die*.

A. W. LATHAM,
Secretary

WYMAN ELLIOT,
Chairman Executive Board.

LIST OF MEMBERS, 1896.

Annual Members.

Adelman, Wm.....	Richfield	Coffin, W. F.....	Hamline
Anderson, Erick.....	Lake Park	Carr, W. A.....	Excelsior
Ayres, H. B.....	Carlton	Cummins, Oswald.....	Eden Prairie
Andrews, J. P.....	Faribault	Cornwall, Ollford.....	Rowland
Akin, D. F.....	Farmington	Clow, H. S.....	Nordine
Aspinwall, N. P.....	Harrison	Conner, O. W.....	Sac City, Ia.
Austin, L. E.....	Glencoe	Comee, S. S.....	Waseca
Aschenbeck, J. H.....	731 4th Av. N., Mpls.	Crawford, M.....	Cuyahoga Falls, Ohio
Abbott, C. A.....	Saratoga	Christian, John.....	Sutton
Anderson, Nils.....	Lake City	Crandall, O. B.....	Red Wing
Applegate, J. O.....	16 S. 4th St., Mpls.	Cuzner, E. A.....	Essex and 27th Av. S. E., Mpls.
Angus, Robt.....	Garfield	Cuzner, Mrs. E. A.....	Essex and 27th Av. S. E., Mpls.
Anderson, John.....	Red Wing	Covell, M. F.....	518 Humboldt Av. N., Mpls.
Ames, E. D.....	Lyle	Christianson, Peter.....	Hutchinson
Barton, Mrs. I.....	Excelsior	Canell, H. B.....	Elliot, N. D.
Brown, C. F.....	St. Peter	Corbett, Prof. L. O.....	Morgantown, West Va.
Becker, J. O.....	Adrian	Cook, M. W.....	Rochester
Barnes, W. K.....	Alexandria	Curtis, Frank.....	Austin
Buttermore, R. H.....	Lake City	Crassweller, A. H.....	511 Lonsdale Bldg., Duluth
Barnev, F. L.....	Viroqua, Wis.	Chadwick, H. A.....	St. James, Man.
Bedford, S. A.....	Brandon, Man.	Crowell, Frank.....	209 Kasota Bldg., Mpls.
Brackett, A. H.....	Long Lake	Charlson, S.....	Sogn
Burnley, H. E.....	Zillah, Wash.	Currie, Hugh.....	Olyde
Barrett, J. O.....	Browns Valley	Church, J. G.....	Lake City
Brewster, Prof. H. W.....	St. Anthony Park	Conyne, N.....	Pelican Rapids
Bussee, H. F.....	Station "A," Mpls.	Doolittle, C. J.....	Evansville, Wis.
Bunnell, M. O.....	Newport	Decker, H. O.....	Dresbach
Brown, Mrs. Wm. R.....	2635 Pleasant Av., Mpls.	DeCou, Franklin.....	E. 7th St., St. Paul
Bradbury, G. B.....	108 1st Av. N., Mpls.	Danforth, Wm.....	Red Wing
Byrnes, A.....	115 1st Av. N., Mpls.	Day, Ditus.....	Farmington
Beals, E. A.....	P. O. Bldg., Mpls.	Doughty, J. Cole.....	Lake City
Brown, J. W.....	Red Wing	Day, L. E.....	Clinton Falls
Blackwell, Mrs. J. W.....	Fort Totten, N. D.	Doudna, J. M.....	Alexandria
Blair, C. L.....	St. Charles	Dowd, Michael.....	New Canada
Broberg, Theo.....	Waconia	Durkee, M. P.....	Hancock
Boodleson, B. J.....	Ortonville	Dedon, W. S.....	Taylor's Falls
Buck, Willard.....	Alexandria	Denny, John.....	Royalton
Boelk, Ferdinand.....	Lansing	Dane, Mrs. Hattie E.....	Janesville
Brown, Mrs. J. H.....	Montevideo	Dahle, T. K.....	Austin
Broman, Aug.....	Atwater	Eklof, John.....	Cokato
Beardsley, W. G.....	Camden Place, City	Ellevogdt, H. C.....	Lanesboro
Buck, Hon. Dan'l.....	Mankato	Engsberg, S.....	Toronto, S. D.
Bonwell, Arthur.....	Blue Earth City	Eskelson, E. L.....	1008 E. 4th St., Duluth
Brunsdale, K. H.....	Hatton, N. D.	Eddy, W. H.....	Howard Lake
Broughton, A. L.....	511 4th Av. S. E., Mpls.	Eddy, W. C.....	Verndale
Bush, A. K.....	Dover	Everest, G. A.....	Duluth
Blackmarr, F.....	Duluth	Engbretsen, Andrew.....	Elk River
Bisby, A. C.....	Lyle	Fryer, W. E.....	Mantorville
Burger, E. H.....	1st Nat. Bank, Duluth	Furber, J. T.....	Madelia
Bennion, Bishop Heber.....	Taylor'sville, Utah	Flatin, G. F.....	Spring Grove
Bass, J. G.....	1616 Taylor Av., Hamline	Frankland, Thos.....	Stonewall, Man.
Burns, Daniel.....	Springfield	Frederickson, L.....	Cobden
Cash, W. H. H.....	New Lisbon, Wis.	Fournelle, Nic.....	White Bear
Carroll, E. C.....	St. Anthony Park	Freeman, Jonathan.....	Austin
Clark, C. B.....	1411 4th St. N., Mpls.	French, A. J.....	Austin
Outts, E. J.....	Howard	Foreman, E. L.....	Dresbach
Crittendon, W. O.....	Dover	Frenn, P. J.....	Red Wing
Christlan, C. H.....	Bloomfield	Fleming, Albert.....	Garden City
Chandler, E. M.....	Minneapolis	Fisher, H. F.....	Winthrop
Cross, Mrs. E.....	Sauk Rapids	Frisselle, Dr. M. M.....	Eureka
Collins, P. V.....	Wright Bldg., Mpls.	Giles, Geo. W.....	Zumbrota
Crooker, Mrs. E. B.....	2212 Ashland Av., Mpls.	Goss, H. M.....	Mountain Lake
Cook, Dewain.....	Windom	Gibson, Wm.....	891 E. Franklin, Mpls.
Crane, H. L.....	Excelsior	Gould, G. F.....	Excelsior

Goodman, D. E.....Faribault
 Greenlee, J. B.....Chatfield
 Gregg, O. L.....Austin
 Guy, John.....Austin
 Galloway, J. E.....Austin
 Gearty, T. G.....Robbinsdale
 Grady, J. B.....100 Wicklow St., Duluth
 Gleason, Ira.....Eden Valley
 Gerdson, Henry.....Victoria
 Griffith, O. H.....Eden Prairie
 Gergen, W. B.....Hastings
 Gwinn, J. A.....Byron
 Gibson, Thos.....Duluth
 Green, Prof. S. B.....St. Anthony Park
 Goodale, S. L.....Saco, Me.
 Gue, W. W.....Lake City
 Haggard, H.....Excelsior
 Hansen, Ivar.....816 11th St. N., Mpls.
 Hacklander, A.....Blue Earth City
 Hartmann, A. M.....724 3d Av. N. E., Mpls.
 Hays, Prof. W. M.....St. Anthony Park
 Haseltine, E. W.....Grand Forks, N. D.
 Harrison, Thos.....Blanchard, N. D.
 Haeg, Ed.....Bloomfield
 Hamstrom, O. J.....50 Central Av., Mpls.
 Hawkinson, Chas.....907 15th Av. S., Mpls.
 Howard, J. A.....Hammond
 Howard, Simeon.....Eureka
 Hartt, Mrs. Geo.....Hagar City, Wis.
 Harris, Ed.....Galesville, Wis.
 Helms, H. H.....Lydia
 Hamlin, A.....Spring Valley
 Hagen, O. J.....Hendrum
 Hotson, A.....Lyle
 Hawkins, J. O.....Austin
 Higbee, W. S.....Albert Lea
 Helwig, Philip.....916 11th Av. N., Mpls.
 Hill, LaFayette.....Chatfield
 Hagen, A. J.....Hendrum
 Humes, Elmer.....Pleasant Grove
 Horrigan, John.....Lake City
 Hebb, E.....Dover
 Hunter, Mrs. J. O.....Duluth
 Hollister, Theo.....Duluth
 Holt, A. A.....228 W. First St., Duluth
 Hendrickson, W. G.....Box 419, St. Paul
 Hill, C. L.....Albert Lea
 Hunter, John.....Anoka
 Johnson, Gus.....Box 139, Excelsior
 Jaques, E. K.....Crystal
 Jamison, R.....Court-House, Mpls.
 Jewett, Z. K.....Sparta, Wis.
 Johnson, J. L.....Owatonna
 Jewett, R. H. L.....Capitol, St. Paul
 Jensen, Jens A.....Rose Creek
 Jordan, J. H.....Dittor
 Johnston, Jas.....Dakota
 Jentoft, O. T.....Bright, S. D.
 Jenson, H. P.....Brownsdale
 Jones, Geo. H.....Spearfish, S. D.
 Johnson, S. V.....1131 W. 2nd St., Duluth
 Jorgenson, Jas.....Albert Lea
 Knudson, H.....Springfield
 Katzner, Rev. J. B.....Collegeville
 Kenney, S. H.....Morristown
 Kennedy, Mrs. A. A.....Hutchinson
 Kimball, F. W.....Austin
 Kennedy, J. W.....Lake City
 King, E. O.....Ibsen
 Knapheide, R.....500 St. Peter St., St. Paul
 Kording, John.....Hayfield
 Kiesel, Louis.....Cahill
 Klein, Jacob.....Hokah
 Keller, Theo.....Woodstock
 Kramer, J. O.....La Crescent
 Koren, J. D.....Engr. Dept. N. P. R. R., St. Paul
 Kolasky, G. W.....Adrian
 Keays, A. W.....Elk River
 Kirk, W. H.....1100 8th Av. S. E., Mpls.
 Kilbourne, F. M.....Lakeville
 Kneeland, N. O.....Owatonna
 Kuethe, Fred.....Sauk Rapids
 Kingsbury, Mrs. D. L.....1996 Milwaukee Av.,
 [Merriam Park
 Kempton, E. S.....607 Lyceum Bldg., Duluth

Keel, R. O.....Rochester
 Kelley, J. P.....Saco, Me.
 Lind, Herm.....Hawley
 Letson, J. H.....Alexandria
 Leonard, Dr. L. D.....Syndicate Bldg., Mpls.
 Lyman, H. M.....Excelsior
 Lord, O. M.....Minnesota City
 Lory, H. A.....Maple Ridge
 Laird, J. C.....Winona
 Lucken, K. J.....Portland, N. D.
 Lyons, Wm.....2024 Clinton Av., Mpls.
 Lietz, L.....Dover
 Longfellow, A. R.....Monticello
 Lawson, Wm.....614 Westminster St., St. Paul
 Luke, F. K.....Ithaca, N. Y.
 Long, A. L.....Excelsior
 Leonard, Dr. H. O.....Balmoral
 Latto, J. W.....La Crescent
 Leach, A. D.....Excelsior
 Leonard, S. F.....Washington
 Leonard, E. A.....Spring Valley
 Lee, Henry.....Anoka
 Loudon, John.....Excelsior
 Little, E. C.....31 Exchange Bldg., Duluth
 Lynn, Jas.....Camp Douglas, Wis.
 Lord, L. P.....Owatonna
 Lindesmith, O.....Owatonna
 Moot, A. T.....Harriett
 Miner, Julius E.....432 Boston Bldg., Mpls.
 Mercalf, F. O.....40 5th St. S., Mpls.
 Murray, J. W.....Excelsior
 Motley, L. F.....2444 Stevens Av., Mpls.
 Moyer, L. R.....Montevideo
 Morisse, G. F.....Alexandria
 Mooser Frank.....1230 Western Av., Mpls.
 Mackintosh, R. S.....St. Anthony Park
 Mackintosh, Wm.....Langdon
 Mohl, Fred.....Adrian
 Mack, Miss Beatrice L.....Marshall
 Melgaard, H. L.....Argyle
 May, L. L.....St. Paul
 Mills, Mrs. J. S.....Elk River
 Morrison, Mrs. D.....Villa Rosa, Mpls.
 Malone, Thos.....Austin
 Mason, J. R.....Forest Mills
 Malberg, O. B.....Warren
 Melgaard, O. L.....Argyle
 Midthun, Rev. M. M.....New London
 Mainz, Simon.....Hastings
 Manahan, Chris.....Chatfield
 Misslin, A. P.....New Market
 Mueller, H. O.....New Ulm
 Magnusson, Sven.....Stark
 Marli, Rudolph.....West Newton
 Molitor, Rev. I.....West Union
 Mesenburg, Frank.....Box B, St. Cloud
 Marshall, Jos.....Washington
 Moses, E. W.....Tracy
 Mackenzie, G. F.....Duluth
 Monson, N. L.....Buffalo Lake
 Matheson, R. H.....Brandon, Man.
 Merritt, C. W.....Homer
 Moltby, Fred, Jr.....Pine Bend
 Mitchell, Dr. O. F.....Good Thunder
 Mesenbring, Otto.....Cologne
 Moore, R. H.....Lake City
 McGinnis, D. R.....St. Paul
 McCool, John.....Barry
 McOlintock, Mrs. J. B.....Lakefield
 McKinstry, A. W.....Faribault
 McOauley, Geo. A.....Anoka
 MacFarland, A. R.....Duluth
 Nelson, Hans.....Fergus Falls
 Nutter, F. H.....701 Sykes Bldg., Mpls.
 Newman, W. M.....Albert Lea
 Nagel, J. T.....710 E. 11th St., Davenport, Ia.
 Nordquist, O. A.....33 W. Sycamore St., St. Paul
 North, Eben.....Pleasant Grove
 Otterness, E. L.....Wastedo
 Ogelvie, Jas.....Blue Earth City
 Oxford, Wm.....Freeburg
 Oved, P. J.....Alden
 Overgard, O. H.....Lerdal
 Orcutt, Wm.....Sauk Rapids
 Otis, L. S.....Staples

Olson, Chris. N.	Hutchinson	Scriven, D. M.	Aitken
Opjorden, O. K.	Millan	Smitten, G. W.	St. Cloud
Ostergren, O. A.	Box 466, St. Paul	Smith, S. B.	Keenville
Pell, Wm. A.	Tracy	Stevens, O. J.	Tyler
Penning, Martin.	Sleepy Eye	Seagren, John.	Scoville, N. D.
Parker, W. L.	Farmington	Stevens, P. A.	Rush City
Pahl, Frank.	Fort Snelling	Shaw, O. W.	Austin
Pond, H. H.	Bloomington	Sundberg, O. A.	Worthington
Pond, E. R.	Bloomington	Saxson, Chas.	Worthington
Perry, G. S.	Farmington	Street, A. H.	Albert Lea
Pendergast, Prof. W. W.	Hutchinson	Stowell, Dan'l.	Perley, Wis.
Palmer, S. G.	116 1st Av. N., Mpls.	Shogren, E.	Red Wing
Putnam, W. H.	River Falls, Wis.	Schechter, J. J.	Worthington
Peterson, L. P.	Freeborn	Studley, H. L.	3131 Hennepin Av., Mpls.
Pennell, Prof. O. S.	St. Anthony Park	Sherwood, Wm. C.	Duluth
Payne, S. D.	Kasota	Shadbolt, Frank.	Caledonia
Prescott, G. H.	Albert Lea	Spickerman, C. W.	Excelsior
Peterreins, Chas.	Wood Lake	Sartell, Mrs. Jos.	St. Cloud
Pye, S. M.	Faribault	Sampson, J. A.	Excelsior
Patten, O. G.	Charles City, Ia.	Smith, T. T.	Box 2337, St. Paul
Pratt, F. F.	Crookston	Smith, C. H.	Excelsior
Parkhill, Robt.	Chatfield	Schiffman, Dr. B.	St. Paul
Page, John.	1117 W. 2nd St., Duluth	Scofield, L. H.	Bloomington
Prichett, John.	Alexandria	Tracy, G. A.	Watertown, S. D.
Potter, A. H.	1206 S. E. 4th St., Mpls.	Tenney, Mrs. P. F. P.	St. Cloud
Pfremmer, C. H.	Spring Valley	Turnbull, John.	La Crescent
Pope, Jed.	Caledonia	Thayer, Mrs. P. A.	Riverside, Cal.
Robinson, Marshall.	640 E. 19th St., Mpls.	Theilmann, O.	Theilmanton
Richardson, S. D.	Winnebago City	Tingley, W. J.	Stillwater
Randall, E. W.	Hamline	Thompson, Thos.	Grand Forks, N. D.
Ray, Mrs. J. W.	2628 Portland Av., Mpls.	Trenham, N. J.	Alexandria
Rosebloom, A. H.	Hutchinson	Taylor, Jas.	Austin
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D. A. Robertson, St. Paul	1895
F. G. Gould, Excelsior	1896

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